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PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

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The OIL WEEKLY

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

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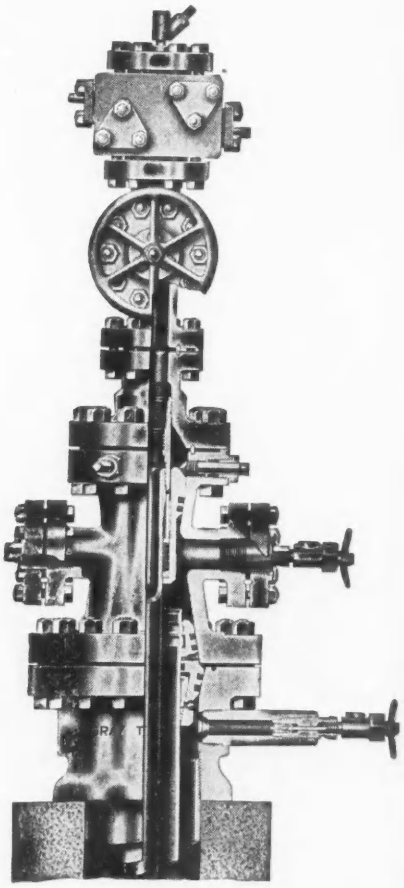

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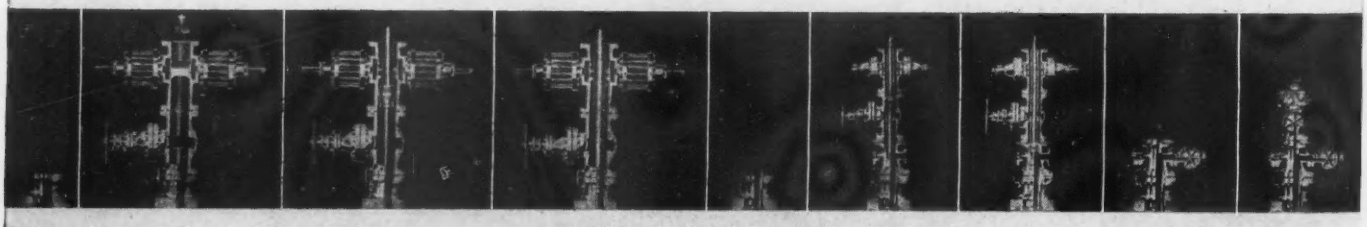


Casing Head Attached | Drilling | Running Casing | Casing Landed | Drilling Control Equipment Removed | Drilling-in and Running Tubing | Tubing Landed | Control Equipment Removed | Manifold Attached

Co-op Tax Exemption Is Listed for Study

THE administration agrees that some revision of the tax laws is desirable to iron out inconsistencies which have developed in past years but is giving no hint to Congress at this time of the position it will take next year with respect to a general overhauling of the tax structure.

Secretary of the Treasury John Snyder before the House Ways and Means Committee failed to give specific recommendations for changes, although he outlined a score of fields which could be studied with a view to eliminating discriminations.

Because of the continued growth of the scope and volume of activities of tax-exempt cooperatives there is need for re-examination of the tax status of those organizations, Snyder declared, adding that "it has been charged that in some instances the present treatment discriminates unfairly against taxable enterprises."

All that business wants here, it might be said, is a non-partisan group that will check into the facts and give Congress the true picture. Unfair discrimination doubtless exists.

Snyder also recommended studies in other tax areas affecting the oil industry, such as the corporate tax structure to determine whether the present rates should be eliminated in favor of a bracket graduation similar to that used for the individual income tax, and a survey of dividends to determine whether the present double taxation, should be eliminated, together with a study of discrimination in taxes between proprietorships, partnerships and corporations.

Snyder also called the committee's attention to the situation of American individuals and corporations doing business in foreign countries, whose subjection to both United States and foreign taxes may comprise an excessive burden unless some allowance is made in our law for taxes paid abroad.

"American corporations and individuals doing business abroad should not be placed at a disadvantage in their competition with foreign firms," he said. "At the same time, so long as they are American citizens and businesses, they should bear their fair share of domestic tax burdens. It is, therefore, highly important that we analyze the combined effect of United States and foreign taxes with a view both to minimizing any existing discrimination and inequities and to ascertain whether such taxpayers are bearing their fair share of taxes."

An American Right—Picking One's Fuel

THE inconsistent stand of American railroads which have consistently fought expansion of the nation's natural gas facilities is pointed to very clearly by the Independent Natural Gas Association.

Railroads are converting to diesels and electrics because "they can't depend on coal and they find electricity and oil more dependable, more economical and cleaner," INGA's News recites. And, it points out, the choo-choo boys are entitled to the American right to use the fuel of their choice.

Then, is the question, what reason can the same railroads have for interfering when the people and industries of some community want to use natural gas?

The railroads aren't interested, of course, in keeping miners on the job. Their only interest is their only interest, i.e., encouragement of use of that fuel which is transported by freight train.

Their energies could better be used in improving rail service to the public. It's a lead-pipe cinch they cannot for long halt progress represented by the continuing widespread demand for natural gas.

☆

The average American today uses as much petroleum every four minutes as he used all year in 1859.

Preaching the Merits Of the Patent System

EDUCATING Americans in the value of the United States patent system has paid excellent dividends in Danville, Ill., where for one week recently an intensive spotlight was focused on the relationship between jobs and the manufacture of patented products.

The National Patent Council called the effort its "Community Operation" and utilized the powers of all local public relations media in putting across the idea that "patents make jobs," that the patent system is the very mainspring of our industrial progress.

Part of the "operation" was an exposition of patented products and products manufactured with patented equipment or processes—products made within the area of the community. In Danville 40 percent of the entire population and 50 percent of all exhibitors' employes visited the exposition.

As a result, a scientific poll showed percentage *gains* as follows: "The public benefits from the patent system" because it makes more jobs, 12 percent; because it creates incentive, 6 percent; because better quality of things are invented, 4 percent. "I personally benefit from the patent system because" it makes my job, 7 percent; it makes my job easier, 7 percent; it protects my company, 3 percent.

These gains are extraordinary in that gains of more than 3 percent is regarded as "almost unheard of in such operations," according to the polling authority.

Manufacturers as well as the National Patent Council—not to mention the public itself—doubtless will benefit from such activities which are designed to preach basic American economic philosophy to American wage earners who hold in their hands the destiny of our nation. Doubtless the same plan is available for and can be carried out by other communities interested in stimulating interest in good, sound Americanism.

THE WEEK'S NEWS

THE Senate has passed legislation creating a National Science Foundation to correlate research and scientific education and the House, now considering the measure in committee, is expected to approve it before the end of the session. Page 31.

Natural Gas Hearings—The House Interstate and Foreign Commerce Committee will wind up its hearings on revision of the Natural Gas Act this week with a view to disposing of the legislation this year, but FPC officials are expected to renew their plea for deferment of action. Page 31.

Hearings on Gas Lines to East—The Federal Power Commission next month will begin a study of Texas-East Coast natural gas lines, starting with the application of Trans-Continental Gas Pipe Line Company and then going into that of Texas Eastern Transmission Corporation. Page 34.

Texas-California Pipe Line—A group of companies headed by Shell interests is considering a pipe line to transport West Texas crude to Wilmington, Calif. Page 34.

Anglo-American Pact Hearing—The long-dormant Anglo-American petroleum agreement will be the subject of hearings set by the Senate Foreign Relations Committee for June 2 and 3 but subject to possible further delay. Page 32.

Favors OGD As Experiment—NPC member William R. Boyd told the Senate Appropriations Committee the oil industry did not seek creation of the OGD and was not consulted, but that it should be continued as an experiment in Government-industry relations; any effort to make it a vehicle for extension of federal regulations will be bitterly opposed, he warned. Story below.

Gasoline Consumption—Motor vehicle gasoline consumption reached an all-time high last year and was reflected in an additional $280 million in automobile fee and tax collections by the states.

West Texas Crude Movement—Shippers are having difficulty getting cars for extraordinary movement of West Texas crude which is scheduled to exceed 80,000 barrels daily. Page 33.

FPC Ruling Frees Producers—Oil and gas producers selling gas to interstate transmission companies are outside FPC jurisdiction under the Natural Gas Act, it was ruled last week. Page 31.

Boyd Urges OGD Continuance Until Its Usefulness Can Be Demonstrated

The oil and gas industries did not seek the creation of the Oil and Gas Division and would be the first to oppose any move by it to increase the scope of federal regulation but, having been set up, it should be continued as an experiment until its usefulness and value can be demonstrated or it is proved that a peacetime program of government-industry cooperation will not work, the Senate Appropriations Committee was told last week by William R. Boyd, Jr.

Boyd made it clear he was not speaking as president of the American Petroleum Institute but as a member of the National Petroleum Council, appearing at the request of Chairman Walter S. Hallanan to urge that the Senate restore funds cut out of the Interior Department appropriation bill by the House for continuance of the non-regulatory activities of the OGD.

Congress Should Fix Policy

"Neither the oil nor the gas industry asked the federal government to create such an agency," he said, adding that should be adequate answer to the charge by the House Appropriations Committee that the OGD was to provide information the industry could not get itself without violating the anti-trust laws.

Expressing some doubt over two activities outlined for the OGD by Interior Secretary J. A. Krug, dealing with the coordination and unification of government policy and administration, Boyd suggested that if there is congressional doubt of the propriety of such activities it should not be permitted to militate against the rest of the program. But, he agreed, "I do think all government policy should be fixed by the Congress and not by administrative agencies set up by executive order.

Boyd said frankly he "suspected" the industry in general feels that the benefit from the OGD's activities "will be negligible," but since the government-industry partnership worked so well during the war, efforts to adapt a similar relationship to peacetime problems deserve support.

"I think there is a clear and useful field in government for such an agency as the OGD," he said. "I do not think it should have or attempt to exercise any power to make government policy or to issue directives to anyone in or out of government. I think its principal function and fundamental objective should be to operate as a service agency to government agencies and to serve as an instrumentality to establish and maintain cooperative relationships with the industry itself. The industry's part in the scheme should always be only to provide information, counsel and advice, when asked, on the problems of oil and gas with which the government is concerned and it should be free to do this in its own way and without pressure or coercion from government.

"I think an OGD, conducted within proper limitations and staffed with competent personnel, could and would render not alone a useful but an invaluable service to the government as represented by the numerous agencies having something to do with oil and gas problems."

There can be no anti-trust problem involved so long as the industry group is limited to giving information and advice when it is asked, he pointed out. At the same time, "the industry is not likely to ask Congress for legislation creating any kind of centralized control, direction or supervision over the oil business," he said.

"I personally am fundamentally and otherwise opposed to any form of federal control or regulation of the operations of the petroleum industry because I believe that control, direction, regulation or needless government interference or supervision would destroy the individual initiative and incentive which is necessary to provide the needed oil supplies for the nation's welfare and security."

Frank Porter Approves

Frank M. Porter, president of the Mid-Continent Oil and Gas Association, also urged continuance of the OGD, which he said is performing a function that is vitally needed and cannot be performed except through some government agency.

Particularly, Porter said, the division can perform a valuable service to the country by heading the development of a remedy for the tight supply situation in fuel oil and other products, since the oil companies cannot get togther and act in concert because of the anti-trust laws, for one thing, and, for another, because the companies, operating re-

World's Deepest

The world's deepest test, Superior Oil Company of California's Weller 51-11, NW NW NE 11-8n-12w, five miles north of Fort Cobb in Caddo County, Oklahoma, was drilling below 17,659 feet on May 23.

Company officials reported an average of 24 feet of hole each 24 hours. A total of 169 feet of hole has been made in the last six days.

gionally, would have only a hazy idea of the national problem.

The IPAA is in full sympathy with the efforts of Congress to reduce government expenditures, Russell B. Brown, general counsel of the association, said, but, he added, "it would be unfortunate if, in the effort to reduce expenses, Congress might inadvertently cripple activities" of importance.

There has not been sufficient time to see how the OGD plan will work out, Brown said, suggesting that it be continued for at least another year. Even if Congress wiped the division out because of lack of basic legislation, he added, the Secretary of the Interior could continue its purposes through his own office.

Following presentation of the industry's views, NPC Chairman Hallanan expressed gratification over the "enthusiastic and unanimous response" of members of the industry who have been named to serve on council committees.

"There could be no finer illustration of teamwork cooperation than has been manifested in the recent response of men who are ready to give their time unselfishly to the solution of these problems that relate to public welfare and national security," he said.

All committeemen will be ready to submit reports to the council at its next meeting, he said.

Natural Gas Meeting

The Natural Gas Department of the American Gas Association has selected Houston and May 4 and 5 for the place and time of its annual spring meeting in 1948. Headquarters will be at the Rice Hotel.

FPC Ruling Frees Certain Producers From Inclusion of Natural Gas Law

The Federal Power Commission last week gave factual evidence of its acceptance of a rule laid down by its staff that oil and gas producers selling their gas to interstate transmission companies are outside its jurisdiction under the Natural Gas Act.

To support an assurance given Senator Ed Moore of Oklahoma that it would issue an administrative rule declaring unequivocally its interpretation of the act as exempting arm's length sales by producers and gatherers from its jurisdiction, the commission announced decisions in a case pending since May, 1942, when Fin-Ker Oil and Gas Production Company applied for a certificate under the "grandfather" clause, and in a more recent application for a declaratory order that the partnership of R. J. and D. E. Whelan would not become a "natural gas" company.

Dismissing the Fin-Ker case for want of jurisdiction, the commission explained that its natural gas operations are confined to production and gathering and the sale at arm's length upon completion of gathering of gas produced from its wells in the Hugoton field in Kansas, most of which is sold to Kansas-Nebraska Natural Gas Company.

The Whelans sought a determination of their status before entering into a final contract with Texas Eastern Transmission Corporation for the sale of gas produced from 3373 acres owned by them in the Whelan gas field in Harrison County, Texas.

In both cases, the commission pointed out that the producers had no connection with the companies to which they deal other than for the sale of their gas. The FPC compared the Fin-Ker situation with others in which it has passed on the same question, in particular the Interstate case now pending before the Supreme Court, and outlined in some detail how they differed.

"We have, on several occasions, indicated quite clearly that the commission has no desire to extend its jurisdiction over the independent producer and gatherer or otherwise invade what are properly regarded as the functions of the conservation authorities of the states," it declared. "Further, the cases decided by the commission do not reveal a single instance wherein we have sought to extend our jurisdiction in an unwarranted manner into those fields—so that any charge that we have or intend to invade such fields has been and is wholly unfounded.

"Consistent with former decisions and public statements of this commission, we hold that, where a person not otherwise subject to the jurisdiction of the commission is engaged in production or gathering of natural gas exclusive of its transportation in interstate commerce and makes arm's-length sales and deliveries of natural gas in interstate commerce as an incident to or upon completion of that person's production or gathering, the provisions of the Natural Gas Act do not apply."

National Science Foundation Bill Expected to be Approved by Congress

Legislation creating a National Science Foundation was passed by the Senate last week and is before a House committee, with the probability it will be approved by that branch before Congress adjourns.

The bill considerably modified from its original form to meet protests from industry, calls for a 24-man board to formulate and encourage an over-all national policy for scientific research and education. It could farm out projects to private research agencies, but would be without authority to exercise any control over the research programs of governmental or non-governmental organizations.

No consideration is given in the measure to the disposition of patent rights in inventions made in the course of research sponsored by the foundation, and the whole subject of government patent policies is to be considered in separate legislation. The Senate committee handling the bill agreed, however, that private organizations in many cases would be unwilling to forego the benefits of any inventions that might develop in the course of their work for the government. The Senate rejected an amendment which would have prohibited the patenting of any invention developed through use of foundation funds unless express permission is contained in the contract.

The foundation will be authorized to initiate and support basic research in the various sciences and also applied as well as basic research on matters related to the national defense, but in general the foundation is not to compete with the programs of other researchers, public or private, but is to fit its research activities into areas not otherwise covered.

The creation of the National Science Foundation may have some effect on the research of the petroleum industry, particularly in fields of fundamental science, such as a bio-chemical research project which seeks to discover the reactions involved in the chemistry of animal and plant life, conducted at the Houdry Process Corporation laboratories, which Sun Oil Company last week announced had been assigned to the Temple University Research Institute.

The project is based on the use of the rare carbon isotope C-13 as a tracer in reactions simulating body metabolism, which is to be produced at a plant now being completed at Sun's Marcus Hook refinery.

Action by Senate on Gas Bill Amendments Unlikely

The House Interstate and Foreign Commerce Committee will wind up its hearings on bills to amend the Natural Gas Act this week with sessions Wednesday and Thursday at which Federal Power Commission representatives will present their views.

The testimony is expected to be a repetition of that given by Chairman Nelson Lee Smith and his associates before the Moore subcommittee of the Senate Interstate and Foreign Commerce Committee April 29.

Smith took the position that it would be "unwise" for Congress to act on revision of the law before the FPC report on its natural gas investigation was submitted sometime this summer.

Smith indicated that the commission planned to meet some industry complaints by the issuance of administrative orders, thus making Congressional action unnecessary.

Action on the legislation by the House this session is not unlikely, but it is believed that that the Senate, which has a full schedule ahead of it, will not take up the matter this year.

Anglo-American Oil Pact Hearings To Start June 2 Before Senate Group

The Senate Foreign Relations Committee last week decided to call the Anglo-American petroleum pact up for hearings June 2. It scheduled only two days for the hearings, apparently believing that this would be sufficient for the entire presentation. The agreement has been pigeon-holed in committee files since September, 1945.

There is some doubt, however, whether the scheduled hearings will be held next week. Senator Tom Connally of Texas is expected to ask the committee tomorrow to defer them in order to give Texas interests opposing the agreement more time in which to prepare their case.

Connally, who says he still has not made up his mind whether to support the agreement, last week sent letters to a number of Texas oil men pointing out that the reservations in the pact eliminate the dangers of federal control which they feared would grow out of the agreement.

Sees No Threat

The Senator has indicated that he does not deem the agreement essential to the proper solution of international oil problems, but at the same time appears to believe that it will not contribute materially to that end. As now written, however, there is nothing in it which he sees as offering any threat to the domestic oil industry.

The version before the committee is the second draft of an understanding reached by United States and British officials, the former led by then Secretary of the Interior Harold L. Ickes. The first draft of the pact was sent to the Senate for ratification by President Roosevelt in 1944, but was withdrawn for revamping after protests from domestic oil interests that it paved the way for government regulation of foreign operations.

The new version sets forth the general principles that the petroleum of the world should be available to all countries on fair terms and that oil resources should be developed in an "efficient and orderly" manner. It provides that all present concession contracts and rights shall be respected.

Provides for Commission

Its most important provisions creates an international petroleum commission, the activities of which are to be confined to studies of the problems of international oil trade caused by dislocations resulting from the war, past and current trends, and the effects of changing technology. The commission also would prepare estimates of world supplies and demand, reporting as to means by which demand and supply may be correlated, and would make such other reports as may be appropriate for the broader general understanding of the problems of international oil.

Under the original agreement, the commission would have had authority to make suggestions and recommendations on broad policies for adoption by operating companies and on action by the British and U. S. governments on short-term problems which might arise in any sector of the world oil trade.

The agreement is designed to be the basis for a world pact to which all other nations, consuming as well as producing, might adhere, but there is considerable doubt that Russia, and possibly one or two other producing countries, now would be willing to participate.

While some interests in the oil industry are opposed to the pact as the possible forerunner of an effort to develop governmental control of the international oil trade, possibly under the United Nations, as suggested last year by State Department officials, there is considerable belief that the agreement means little so far as the foreign operations of American companies are concerned.

Hyde Park Papers Center Of Arabian American Probe

The Senate War Investigating Committee's probe into the affairs of Arabian American Oil Company degenerated last week into a squabble over whether the committee or a three-man group designated by President Roosevelt should determine which of the late president's papers at Hyde Park should be made public.

Committee Chairman Owen Brewster of Maine took exception to President Roosevelt's instructions.

"The responsibility for deciding which files are to be revealed to the public and which are to be kept a secret should rest, not with three private individuals designated in the memorandum, but with the members of the Senate committee whose official capacity renders them more capable to decide the issue of revelancy of the documents as it applies to the current investigation," he contended.

The committee is expected to make another effort to develop the excessive profits which Arabian American is alleged to have made out of its contracts with the Navy, and will resume public hearings about the middle of next month. So far, the only testimony received has been from Moffett, who brought the charges.

Officials Are Announced Following Scout Meeting

Howard R. Brooks, chief scout for Magnolia Petroleum Company, Dallas, was elected president of the National Oil Scouts and Landmen's Association at its annual convention in New Orleans which ended May 17. Brooks succeeds S. S. Stinson, Humble Oil & Refining Company, Midland, who becomes a member of the executive board.

Others elected were Wiley Wiggins, Atlantic Refining Company, Tyler, Texas, first vice president; Fred Jackson, Phillips Petroleum Company, Shawnee, Okla., second vice president; R. L. Denton, Magnolia Pipe Line Company, Midland, third vice president; Ray E. Stevens, Shell Oil Company, Jackson, Miss., secretary-treasurer, and Wayne Ferguson, Shell Oil Company, Wichita Falls, Texas, editor-in-chief of the association's yearbook.

Bill Approved Extending Public Lands Lease Law to "Acquired" Federal Tracts

Legislation extending to "acquired" federal lands the mineral leasing laws applicable to the public lands was favorably reported last week by the Senate Public Lands Committee.

While covering a variety of natural resources other than metalliferous metals, the bill is designed further to stimulate discovery of new petroleum reserves and promote development of oil and gas on the lands which have been acquired by the government over a period of years, other than lands acquired for development of mineral deposits. This exception has special reference to helium, but also would apply to fissionable materials or any other mineral absolutely essential to the defense of the country.

In an amendment to the measure, which was introduced by Senator Robertson of Wyoming, the committee provided that rights of lessees on the acquired lands under present law shall be protected but any person qualified to hold a lease who, on the date of enactment of the bill, has an application pending for lands not situated within the known geologic structure of a producing oil or gas field shall have a preference right to a lease without competitive bidding.

Interior and Agriculture officials differed over the desirability of the legislation, Undersecretary of the Interior Oscar L. Chapman favoring its enactment while Assistant Secretary of Agriculture Charles F. Brannan opposed it.

Brannan declared that the bill deals with only part of the problem and should be extended to cover the disposal of all the mineral resources in the acquired lands. He also objected on the grounds that important revenues would be lost to the government through the elimination of competitive bidding for leases, through which the department obtained approximately $3,200,000 in bonuses in the past two years and through the reduction of rentals by the substitution of the leasing act rentals for the graduated scale followed by the department.

Joint Conference Committee Working On Labor Bill; Will Truman Veto?

A joint conference committee from House and Senate is attempting to iron out differences in the labor bills passed by the two chambers, but whether the resultant measure will be approved by President Truman or could be passed over his veto are questions which probably will not be answered until June.

The legislation was passed in both houses by substantially more than the two-thirds vote necessary to override a veto, but it was admitted that a number of members in both bodies who voted in support of the measure would not vote to overrule the President.

The bill passed by the Senate was much less severe than that adopted by the House, but equally unpalatable to organized labor and, reportedly, the President, and the measure that comes out of conference is expected to be in between the two.

Both versions provide for injunctions against strikes which would imperil the public health or safety, but while the House bill would make jurisdictional and sympathy strikes, featherbedding practices and boycotts illegal, the Senate merely declared jurisdictional strikes and secondary boycotts unfair labor practices. Both bills, however, provide that persons injured by such activities may sue the responsible union for damages.

The House prohibited bargaining on a national or industry-wide scale while the Senate permitted industry-wide bargaining but with a restriction that a union may not strike to force an employer into industry-wide negotiations.

Both bills outlaw the closed shop but permit the union shop and other forms of "union security," and both provide that no union may be certified as a collective bargaining agent if one or more of its officials are or have been members of the Communist Party or Communist sympathizers.

Further Differences

Both houses provided that employers would not be required to bargain with unions of foremen or supervisory employes, but the Senate omitted a prohibition included by the House against a strike to force an employer to recognize a foremen's union.

The House bill would forbid an employer to contribute to any welfare fund over which a union exercises any control whatsoever and would outlaw strikes to compel employer contributions to a welfare fund, while the Senate makes such a fund legal if an employer participates on an equal footing with the union in its administration.

The House bill also provides penalties for mass picketing and strike violence, prohibits political activity by unions and sets up a long series of unfair practices regulating the relationship of a union and its members which are not included in the Senate measure.

Both bills provide that unions may be sued in federal courts, forbid unions to coerce workers in their exercise of collective bargaining rights, require the filing of financial reports by unions, guarantee free speech to employers and require that unions may not refuse to engage in collective bargaining.

Effect of Mexican Export Said Negligible in U. S.

Washington officials appear little concerned over reports from Mexico that a commission appointed to survey the Mexican oil industry has recommended that exports be suspended in order to build up domestic reserves.

They pointed out that total receipts from Mexico last year amounted to only 6 million barrels out of a total of 138 million barrels imported, and said that while the current tight situation makes it desirable to safeguard all supplies, the amount involved is so small as to be negligible.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED May 24	May 17
Alabama	1,100	1,100
Arkansas	74,500	74,750
California	921,800	913,600
Colorado	40,500	40,000
Florida	475	475
Illinois	185,800	186,300
Indiana	18,000	18,100
Kansas	287,900	286,450
Kentucky	25,900	25,800
Louisiana	414,000	413,750
North Louisiana	98,000	97,750
South Louisiana	316,000	316,000
Michigan	42,000	41,000
Mississippi	92,500	89,300
Missouri	100	100
Montana	22,750	23,100
Nebraska	600	600
New Mexico	105,850	105,850
New York	13,450	12,900
Ohio	9,000	8,800
Oklahoma	387,000	385,750
Pennsylvania	35,050	34,100
Tennessee	25	25
Texas	2,226,850	2,226,850
Tex. R. R. Comm. Districts:		
Dist. 1—South Central	21,100	21,100
Dist. 2—Middle Gulf Coast	159,160	159,160
Dist. 3—Upper Gulf Coast	485,170	485,170
Dist. 4—Lower Gulf-S.W.	243,420	243,420
Dist. 5—East Central	38,360	38,360
Dist. 6—East Texas Field	338,000	338,000
Dist. 6—Rest of Northeast	112,500	112,500
Dist. 7-B—North Central	38,200	38,200
Dist. 7-C—West Central	36,790	36,790
Dist. 8—West	530,130	530,130
Dist. 9—North	137,800	137,800
Dist. 10—Panhandle	86,220	86,220
Virginia	200	200
West Virginia	7,800	7,800
Wyoming	114,450	113,300
Total United States	5,027,600	5,010,000

Total stocks, foreign and domestic, May 17, as reported by the Bureau of Mines were 237,303,000 barrels.

West Texas Movement Set To Exceed 80,000 Daily

Scheduled shipments of crude by tank cars from West Texas and Southeastern New Mexico to supplement pipe line movement, which averages from 580,000 barrels to 590,000 barrels daily, will exceed 80,000 barrels daily. All shippers are having difficulty in procuring the required number of cars for this service. This oil is consigned to refineries in Texas, Louisiana, Kansas and Canada.

The Texas Company is the latest to announce plans for supplemental rail shipments, having arranged for the daily delivery of 8000 barrels of Slaughter field crude by Texas-New Mexico Pipe Line Company to the Midland rack of The Atlantic Pipe Line Company for loading. This oil will be consigned its Houston refinery and terminal.

Railroad Sets Limit

Humble Oil & Refining Company stepped up its rail shipments to 23,000 barrels daily the past week, and has arranged for extra crude to move 50,000 barrels daily in tank cars as soon as cars become available. This oil is loaded by Atlantic, which is also shipping 5000 barrels daily for its own account, while 10,000 barrels daily will be handled for Magnolia Pipe Line Company starting June 1. Atlantic's loading facilities have been increased to attain a maximum of 100,000 barrels daily, but the Texas Pacific Railroad has set a temporary limit of 300 cars or 66,000 barrels daily on east bound shipments.

Scurlock Oil Company is shipping 4400 barrels daily from Post to McPherson, Kansas, while it also serves the Polar and Jameson fields by marketing the oil in tank cars. Sinclair Refining Company is shipping 1800 barrels daily from Jal, N. M., to a Canadian refiner. Wickett Refining Company has contract for the delivery of 950 barrels daily from its Wickett, Texas, rack to the McNutt Oil & Refining Company's refinery at Brickland, N. M.

Oil Compact Governors Would Call on Truman

Plans for presenting the Interstate Oil Compact Commission bill to Congress are now being considered by its members. Renewal of the Compact is necessary every two years.

The program under consideration provides that governors of the 19 member states call in a body on the President, personally, and request that he bring the subject to the attention of the State Department, through which the bill would be handled.

Sponsors of this plan believe that it would do much to bring to the attention of the entire nation the activities of the Compact, and demonstrate effectively that the states need no help from the federal government to work out their internal affairs. This is particularly significant at a time when the Federal Power Commission appears to be reaching for more authority.

Texas-New York Project Before FPC on June 9

The Federal Power Commission will begin a study of the extension of natural gas service to the New York-Philadelphia area markets June 9, when it will open hearings on Trans-Continental gas Pipe Line Company, Inc's., application for a $130 million Texas-Eastern Seaboard system.

Trans-Continental was originally organized for the purpose of acquiring the Big Inch lines which finally went to Texas Eastern Transmission Corporation, whose application for a certificate for permanent operation now is pending before FPC. Industry experts figure that the New York-Philadelphia market could absorb the full supply of several big lines.

The Trans-Continental application envisages a 1380-mile 26-inch line from near Hemphill, Tex., to various delivery points in New York, New Jersey, Pennsylvania, Delaware and Maryland, with 296 miles of 26-inch and smaller lines between Hemphill and the Carthage, Old Ocean, Chocolate Bayou and Pledger gas fields, gas dehydration plants in those fields, 14 main-line compressor stations with an aggregate of 141,000 horsepower, and 45 miles of branch lines for deliveries to eastern markets. Its capacity would be 325,000 Mcf daily.

Welding Operations Begun On Magnolia Oil Carrier

Magnolia Pipe Line Company has received sufficient stockpile of pipe for its projected 647-mile 20-inch crude line from Corsicana terminal, East Texas, to Patoka, Illinois, to enable contractors to start welding operations before the end of the month. Trucking contractors are engaged in stringing pipe from Winfield, Northeast Texas, towards Arkansas and southwest towards Corsicana.

This carrier will have an initial capacity of 100,000 barrels daily, using 4 mainline stations, and if pipe deliveries adhere to schedule it will be in operation next spring.

Corsicana is the main cross roads of Magnolia's pipe line system, while Patoka is the point of interception of the company's 366 miles of 10-inch discharge line from Wood River, Ill., to Lima, Ohio. Crude receipts at the Patoka terminal will be routed east and west to connecting lines that serve the Socony-Vacuum Oil Company's refineries and plants of other concerns.

Car Rack Planned by Shell

Shell Pipe Line Corporation has authorized the construction of a 50-car capacity rack on the Santa Fe Railroad adjacent to its West Texas terminal at McCamey to transport crude with high viscosity from the Toborg field, Pecos County, to Shell Oil Company's refinery at Wood River, Ill. This movement will amount to about 950 barrels daily, and will enable the company to utilize its 10-inch carrier from McCamey to Wod River to a greater advantage in excluding the high viscosity oil.

Texas-California Line Discussed

Plans for the construction of a 20-inch crude oil line with a capacity of about 150,000 barrels daily from a point near McCamey, West Texas, to Wilmington, Calif., are being developed in California by a group of companies headed by Shell interests.

Shell officials say the line is being given serious consideration but no definite conclusions have been reached.

The proposed carrier would be the first carrier to transport crude oil from the Southwest to the Pacific Coast. Located at Wilmington are several refineries with a total capacity of more than 200,000 barrels daily.

The proposed line would serve to ease California's existing situation of higher demand for products and decreasing oil reserves. Cost of piping oil from West Texas would also be less than shipping Venezuela crude to California by tanker through the Panama Canal.

Companies having refineries at Wilmington are Richfield Oil Company, Pacific States Oil Company, Fletcher Oil Company, Tide Water Associated Oil Company, Union Oil Company of California, and Shell Oil Company.

FPC Sets Hearing for Northern Natural Project

The Federal Power Commission will open hearings June 16 on an application of Northern Natural Gas Company for facilities to increase the capacity of its system from the 407,000 Mcf daily which will be attained upon completion of construction already authorized to 580,000 Mcf daily, at a cost of $24.5 million.

The proposed facilities include a 10,000-HP compressor station near Garden City, Kan., and 320 miles of 26-inch pipe line to Palmyra, Neb.; 245 miles of 24-inch line to complete looping from Palmyra to Farmington, Minn.; 17.3 miles of 20-inch line from Palmyra to Saunders County, Neb., and addition compressor power, a dehydration plant and appurtenant equipment.

At the same time, the commission will re-hear Northern's applications for construction of facilities to make deliveries to Iowa Electric Light and Power Company for fuel requirements and extension of its line to Marshalltown, Iowa.

PIEA and PESA Announce Dates for 1948 Meeting

Officers of the Petroleum Industry Electric Association and its affiliate, the Petroleum Electric Supply Association, have announced that the 1948 joint annual meeting will be held in Dallas, June 1, 2 and 3. Headquarters hotel will be designated later.

Texas Part of Monterrey Gas Line Is Under Way

Construction of the Texas leg of a natural gas pipe line from Hidalgo County to Monterrey, Mexico, is under way. The 16-mile, 12¾-inch carrier is being laid by Reynosa Pipe Line Company, a subsidiary of La Gloria Corporation, will run from the South Weslaco gas field to a point on the Rio Grande River seven-tenths of a mile east of the Hidalgo-Reynosa international bridge. The line will cross the river at this point for a Monterrey connection.

The firm of Gas Industrial de Monterrey, S.A., is financing the construction of the 150-mile Mexican section.

La Gloria already has four deep gas and gas-distillate producers in the South Weslaco field, in addition to its nearby gas source in the Mercedes field.

Texas Line Commenced

Magnolia Pipe Line Company will receive initial barge delivery from Eastern mills of the pipe to be used in constructing 183 miles of 12-inch products carrier from Spindletop terminal, near Beaumont via Houston to Hearne. Smith Contracting Company was given contract to lay this unit, and is at work in clearing right-of-way to commence welding about June 1.

The Texas Pipe Line Company will construct and operate an extension of the system from Hearne to the Dallas-Fort Worth area, involving 146 miles of 10-inch line, with laterals to Austin and San Antonio.

Few Changes in Texas MER Seen After Hearings End

Hearings to determine present maximum efficient producing rates for all Texas oil fields were concluded last week by the Texas Railroad Commission. The evidence submitted generally indicates that field capacities have been affected little since the statewide survey made last summer.

Of particular significance, however, were some changes requested at last week's meetings relative to a number of fields in West Texas. Recommendations of The Atlantic Refining Company and Continental Oil Company would reduce the MER for Foster from slightly over 30,000 to 20,000—22,000 barrels daily. Requested rates for the Fullerton (Clear Fork) field range from 65 to 100 barrels per well on a calendar day basis. The present figure is 70.

Gulf Production Company wanted the MER for Goldsmith increased from 25,000 to 30,000. Operators generally wanted the rate for Keystone (Ellenburger) reduced from its present 32,500. Seminole would be reduced from 22,000 to 15,000 if Humble Oil & Refining Company's request is followed, but Atlantic wanted an increase to 27,000.

Recommendations for Slaughter range from 45,000 to 83,000 barrels. The present MER is 55,000. For Wasson, requests range from 50,000 up to the present rate of 78,000. Humble asked that Yates be upped 50,000 to 55,000 barrels.

API Production Division

Four hundred register at Amarillo sessions for technical papers and industry discussions

By ANTHONY GIBBON
Staff Writer

Technical papers and discussions on natural gas production methods, coring and drilling techniques, and field unitization problems featured the annual spring meeting of the Mid-Continent District, Division of Production, American Petroleum Institute, last week at Amarillo, Texas. Approximately 400 industry representatives registered for the sessions.

At the opening general session at which Harold S. Kelly, Phillips Petroleum Company, Bartlesville, Okla., and R. C. Kay, Amarillo, presided, the group was welcomed by Mayor Lawrence R. Hagy of Amarillo, and Jake L. Hamon, vice president, API Division of Production, Dallas.

Principal speakers included Don Emery, vice president and general counsel, Phillips Petroleum Company, Bartlesville, whose address was entitled: "State Cognizance of Federal Power," and Don E. Gilman, executive vice president, Western Oil and Gas Association, Los Angeles, who discussed the API's public relations program. Emery warned state regulatory bodies against arbitrary exercise of rights in connection with the natural gas industry, pointing out that such a course would result in public demand for federal control against which the industry has been fighting for some time.

Group sessions chairmen included: natural gas, J. R. Evans, Stanolind Oil and Gas Company; unit operations, W. L. Horner, Barnsdall Oil Company, Tulsa; coring and drilling, C. M. Copeland, Williams-Copeland Drilling Company, Tulsa, and Fred J. Neslage, West Pampa Repressuring Association, Pampa.

State Cognizance of Federal Power

By DON EMERY, vice president and general counsel, Phillips Petroleum Company, Bartlesville, Okla.

The Natural Gas Act should be amended so as more precisely to define the mechanical boundaries of the production and gathering of natural gas for interstate commerce, with particular reference to their political and geographical setting and proper rectification will occur only by congressional amendment as proposed in pending House Resolution 2185. Such an amendment however, will carry with it the implicit warning that Congress still has power to invade the fields of production and gathering for interstate commerce transportation, and use of this power depends upon the discernment with which state governments are cognizant of this federal power and upon the mechanisms they adopt to facilitate with economy, stability and uniformity the delivery of gas for movement in interstate commerce. A recognition of the imminence of such congressional invasion should constitute the urge of state governments to discharge the responsibilities imposed by the establishment of a federal policy to abstain from regulation in the fields of production and gathering by avoidance of loading upon customers needless waste and expense. The outlook, however, is clouded by the intention of the National Association of Railroad and Utility Commissions to ask Congress, by the amendment of the Natural Gas Act, to consent specifically that state governments exercise all regulatory power in the interstate commerce of gas not committed to the Federal Power Commission under the act and this may lead to discriminatory exercise of such power. This amendment provision should be defeated because it invites state governments to burden interstate commerce in natural gas so as needlessly to increase delivery cost to consumers and this would result in prompt demand by consumers that Congress assume the exercise of that regulatory power that we are now petitioning Congress to forego.

A Progressive Program on Public Relations For the Oil Industry

By DON E. GILMAN, executive vice president, Western Oil and Gas Association, Los Angeles.

Detailing highlights from the recent nationwide survey taken by the oil industry, the speaker pointed out misconceptions in public thinking and urged oilmen to do their share to enlighten the general public. He pointed out that although the industry leads all others in the benefits it provides employes, only 5 percent of the people are aware of it. Neither does the public have an appreciation of the industry's contribution to higher standards of living and industrial progress. According to the survey, 45 percent of the people could not name a single by-product of oil. On the other hand, of the 65 classifications of people interviewed, those in the oil industry had the highest regard for it. That the industry is intent upon correcting these misconceptions is seen in the public relations program it has undertaken. A good deal of this public relations work is done at the "grass roots," community by community, with district committees representing every phase of the industry as well as large and small companies. The speaker urged group members to make one public relations contact with people outside the industry at least once a month and pointed out that in enlisting the production men's aid "the total will be 15 million contacts a year—15 million Good Neighbors." If the people recognize the benefit of the industry to the nation, the speaker concluded, the industry will be able to offer greater economic security for all who work for it, better products for customers and better service to the nation.

Developments in the Carbon Black Industry

By IRA WILLIAMS, J. M. Huber Corporation, Borger, Texas.

Attempts continually are being made to increase the efficiency of the channel and furnace processes used in the manufacture of carbon black which last year produced approximately 1200 million pounds, much of which is being used in the manufacture of synthetic rubber.

Much improvement in yield from the channel process, source of the finest carbon black, has been obtained by better draft control, while experimental work is also going ahead with carbon furnaces and it is expected that new furnace carbons produced either from natural gas or other fuels will become a permanent adjunct to channel black for many purposes.

Synthetic rubber manufacture has increased the importance of carbon black as no other substance known at present can closely approach its ability to impart resistance to cutting, chipping, tearing and abrasion.

The Monroe Gas Field and Its Pressure Behavior

By DON T. MacROBERTS, United Gas Pipe Line Company, Shreveport, La., PRESTON FERGUS, Union Producing Company, Monroe, La.

The Monroe gas field located in the northeastern part of Louisiana is a stratigraphic trap "in reverse" gas having migrated into the gas rock at the pinch-out and moving into the thick portion of the formation until further advance was prevented by the absence of permeability. As of January 1, 1947, a total of 1595 wells had been drilled in the field of which 1460 were producing. Lack of core data and other criteria during the early development of the area prevented an accurate evaluation of capacity and reserves but these have been estimated at approximately 5500 billion cubic feet. Early decline curves were based on a simple average pressure weighted by acreage and results obtained are very close to present-day estimates. The field has produced about 4 trillion cubic feet of metered gas. The field presents the phenomenon of a continuous reservoir depleted for all practical purposes in one portion and retaining its initial pressure in other portions. Early concentration of development in the southeastern part of the field which covers approximately 370 square miles, had little or no depleting effect upon the large undrilled or sparsely drilled areas. Gradually, development progressed to the north, northwest and west with wells being completed at pressures of 1030 pounds per square inch. In a large part of the southeast quarter of the field pressure has declined to less than 100 pounds per square inch. Porosity and permeability have been the predominant factors governing recovery and pressure in various sections of the field. In addition to the major pressure wave resulting from the initial production history there have been innumerable minor and local pressure waves, or depletions and restorations, resulting from localized drilling conditions as well as temporary shut-in of wells.

Productivity of Individual Pay Zones Used For Determining Complete Efficiencies—Hugoton Field, Kansas

By R. B. LEFEVER and HENRY SCHAEFER, Stanolind Oil and Gas Company, Tulsa.

Determination of the productivity of individual pay zones in the Hugoton field allows the operator to more efficiently plan the completion of a well in order to obtain the maximum deliverability or potential. An instrument called a bottom-hole flowmeter has been used to determine the relative volume of gas or the individual productivity of each of

the pay zones. Gas producing horizons in the Hugoton field include the Hollenberg, Herington-Krider, Winfield, Towanda and Fort Riley. Previous to ascertaining the individual productivity of each pay zone it was the general belief among operators in the Kansas portion of the field that the Fort Riley limestone was the main producing zone and was considered the most prolific gas producing member of these Permian gas pays. Based on flow information obtained on 70 wells it was found that the Hollenberg was producing 1.9 percent of the total gas production, the Herington-Krider 34.9 percent, the Winfield 24.4 percent, the Towanda 21.3 percent and the Fort Riley 17½ percent. The information obtained also indicated that the Hollenberg formation was capable of producing gas in commercial quantities in some parts of the field. Distribution of the relative deliverability of each of the pay formations is shown on a series of cross sections of wells in different parts of the Hugoton field and indicates a wide variance in deliverability per formation. By using this information it is possible to plan the most effective method of completing wells by concentrating on the formations which produce the largest volume of gas in the respective areas. Recommended are correlation of all available data such as electrical logs, core analyses, structure position and other related information to further improve completions and assure maximum production.

Modern Methods of Deep Contract Drilling

By JACK H. ABERNATHY, Big Chief Drilling Company, Oklahoma City.

Data presented summarize drilling experience for several wells in the 10,000-foot range drilled in the McClain-Garvin County, Oklahoma, area with principal operating practices and techniques described.

Improvements in deep well drilling can be made in operating technique and supplemental rig equipment which can be refined for better performance. In this category are listed quality of mud, rotary rpm, automatic slips, automatic pipe racking, etc. Additional derrick floor space is desirable to overcome current crowding of machinery. Additional power is considered in providing for more efficient pumping rather than for hoisting requirements.

Performance of drawworks, pumps, transmission, drill pipe and miscellaneous rig equipment in drilling 10,000-foot wells in the McClain-Garvin County area is discussed with references for purposes of comparison to similar drilling practices in West Texas and other areas and graphic charts illustrate the more important information.

While representing a summary of drilling experience for several wells in the 10,000-foot range and not to be considered as being of exact application to any specific area since geological formations and other conditions encountered differ from place to place, the data offered are considered representative of present day operations and indicative of direction in which improvements must be made in order to reduce cost of exploratory development in tomorrow's deep wells.

Unitization in Oil Fields in the United States

By K. E. BEALL, Phillips Petroleum Company, Bartlesville, Okla.

Tracing the history of unitization which is successfully practiced in a large number of operations, the paper is concerned solely with units formed for secondary recovery or pressure-maintenance purposes. A survey covers 47 units already in operation in eight different states of which 33 are utilizing secondary recovery methods and 14 pressure-maintenance methods. Different methods used in establishing equities are shown. The paper advances suggestions as to when a unit should be formed, how to form it, and points to be covered in the unitization agreement. It points out that the primary cause of delay in most unitization efforts is not due to technical problems but to lack of sufficient interest on the part of management and interested companies. Since results obtained through unitization have been outstanding with increased recoveries running into millions of barrels of crude and increased profits, there should be no reason why executives should not devote sufficient time and attention to these matters to facilitate their accomplishment. If units can be formed and most modern production methods applied wherever applicable in many pools already discovered or to be found later, there will be made available to the industry and the public hundreds of millions of barrels of additional oil which could not otherwise be obtained. This increase will mean greater profits to operators, royalty owners, state and federal agencies and will constitute a measure of security in the event of future war.

Officers Elected

William L. Horner, Barnsdall Oil Company, Tulsa, was elected chairman of the Mid-Continent District Division of Production of the American Petroleum Institute. Other officers include R. P. Moscrip, Shell Oil Company, Wichita, vice chairman for Kansas; J. R. Phillips, independent operator, Borger, vice chairman for the Panhandle; J. R. Field, Sohio Oil Company, Oklahoma City, vice chairman for Central Oklahoma; Jack Abernathy, Big Chief Drilling Company, Oklahoma City, secretary-treasurer, and Harold S. Kelly, Phillips Petroleum Company, Bartlesville, Okla., chairman of the advisory committee.

W. L. Horner

Results of Experimental Water Flooding In the Haynesville Field

By P. S. ERVIN, Haynesville, La.

The Haynesville Pettit lime reservoir underlies a surface area of 14,500 acres. The Upper Pettit section is a relatively thin and uniform oolitic lime except for a thin shale break covering approximately two thirds of the field and separating the Upper Pettit into two porous sections. Geological data indicates the reservoir to be a sealed stratigraphic trap. From the production history, bottom hole sample analyses and pressure data, it has been determined to be a solution gas drive reservoir. Recoveries under natural production methods are estimated to be 18 to 20 percent. Recoveries under pressure maintenance operations, with central injection of 80 percent of the produced gas, have been estimated to be not over 30 percent of the original reserves.

Experimental water flooding operations commenced in March, 1946, indicate that a minimum of 37 percent of the original reserves can be recovered under such operations with no water production and assuming coverage of 100 percent of the field. It is concluded that water-flooding operations can be economically conducted in fields of 40 to 80-acre well spacing provided injection capacities are sufficient, and that a single line drive pattern as contemplated for the Haynesville Upper Pettit will give economic results provided the field is still producing economically in the primary stage.

Increased daily production of large quanties of oil directly attributable to the water flooding program will occur when the water flood becomes a linear system. The pressure maintenance program will provide energy for lifting the large quantities of additional oil to be recovered as a direct result of the water flooding operations.

Restored State Method for Determination Of Oil-in-Place and Connate Water

By W. A. BRUCE and H. J. WELGE, The Carter Oil Company, Tulsa.

A description of experimental work designed to restore the original reservoir fluid state in cores is presented. The cores taken from an oil or gas reservoir are first saturated with the oil field brine. The water filled core is placed on a semi-permeable membrane which is permeable to the flow of water but impermeable to the flow of gas or oil. Oil or gas is then used to displace water from the core. The semi-permeable membrane permits the establishment of a difference in pressure (capillary pressure) between the oil or gas and the water. When the capillary pressure as obtained by this technique equals the capillary pressure calculated for the reservoir, the core is considered to be restored to its original reservoir state. After the fluids are placed in the core and the proper capillary pressure is established a determination of the original reservoir connate water and oil-in-place can be made by direct measurement of the oil and water in the core.

A comparison of oil and water in cores restored by this method and the oil and water found in cores taken with oil-base mud in five fields showed reasonably satisfactory agreement. This is believed to provide suitable proof that the restored state method of determining connate water is reliable. In the event the core material is highly argillaceous, techniques are given which permit the determination of oil-in-place in terms of bulk volume (or net acre feet of sand) without the necessity of determining the porosity of the sand. This is of considerable advantage, since porosity determination of such cores is either unreliable or very difficult. In this paper connate water, as determined by the capillary pressure method, and permeability are roughly correlatable. In some cases electric log readings are correlatable with connate water, although it has been observed that in certain cases the electric log readings bear no direct relation with connate water.

It is indicated that cores restored with oil and water in the proper distribution by this restored state technique can be used in other tests concerning the behavior of fluids in porous media.

Centrifugal Compressors

FOR GAS TRUNK PIPE LINES

By M. C. SHAW and E. T. NEUBAUER
Allis-Chalmers Manufacturing Company

THE application of centrifugal compressors to the transfer of natural gas from producing fields to points of distribution for industrial and domestic purposes has been discussed frequently. The transportation of natural gas through pipe lines presents two widely different requirements, the first being the compressor installation at the producing field where the gas is compressed from the rock pressure of the field and/or that of the gathering pipe line system to the line pressure. This operation usually involves a considerable increase in pressure, or in other terms, the compressors are required to operate at a high-pressure ratio.

The second phase is the propulsion of gas through the pipe line by means of compressors more or less uniformly spaced along the pipe line. These compressors are required, in usual practice, to produce a much smaller pressure rise than those in the first category.

Now, by their very nature, centrifugal compressors are well adapted to handle comparatively large gas volumes and modern pressure ratios. However, they can be connected in series to produce the pressure ratios needed for the producing field stations, for example, to compress from 150 or 200 pounds to 800 or 900 pounds per square inch, a pressure ratio of 5.5/4.5. Their adaptability for large volumes means that one compressor of relatively small physical dimensions could handle the entire capacity of a very large line. The same thing applies to booster units distributed along the line. A single compressor unit could easily handle 265 million standard cubic feet per day, boosting from perhaps 600 psi to 900 psi, a pressure ratio of about 1.5/1.

Economic and practical operating experience undoubtedly would dictate provision of spare units or subdivision of units.

Centrifugal compressors of the sizes adaptable for pipe line service may be driven by electric motors, but in commercial practice usually would require operation at speeds higher than 3600 revolutions per minute, and therefore a speed-increasing gear would be required to obtain the most efficient performance. However, due to the large horsepower to be transmitted, the gear problem for this application is difficult and should be avoided. Where electric drive is desired for other reasons it is possible to install a 4- or 5-stage machine operating at 3600 rpm for ratios of compression of about 1.25/1 (Figure 4).

Axial Compressor

Considerable interest has been shown in the possible application of the axial compressor to this service in order to capitalize on the inherently high efficiency of this type machine. The axial compressor is generally best suited for applications requiring large volumes of gas at a relatively constant rate of flow. The actual capacity, for a gas pipe line, could be controlled by speed control of the compressor or by dropping the line pressure, thus decreasing the line capacity without change in gas volume through the compressor.

The high inherent efficiency of the axial compressor permits the use of many stages and correspondingly high ratios of compression. The volume under discussion in this paper would require a compressor of small physical dimensions operating at a very high rotative speed. If a machine of this design were to be driven by an electric motor operating at 3600 rpm it would require a gear unit operating far above present commercial gear ratings. Therefore, the use of an axial compressor would require a high-speed prime mover which would operate at compressor speed with a direct-connected shaft.

For the gas pipe line application an axial compressor may be designed to operate at 3600 rpm and directly connected to a 3600 rpm electric motor but it would not have the most favorable dimensions. The ratio of blade length to cylinder diameter would be such as to sacrifice efficiency.

Centrifugal compressors are essentially durable machines and can be operated for extended periods without shutdown, requiring only positive lubrication of bearings and shaft seals and, therefore, completely automatic substations should be entirely feasible.

Within certain limits they are self-regulating, that is, the capacity of a machine driven at constant speed may vary according to the demand on the system. If the variation in demand exceeds the limits above mentioned, other means are available to regulate the flow of gas automatically. These means will be discussed briefly later.

The operation of a centrifugal compressor is similar basically to a centrifugal pump, the compression and delivery being produced for the service under discussion by a number of impellers operating in series in a casing, and possibly two or more casings operating in series. If the speed is constant, any variation in delivery is accompanied by a change of delivery pressure, usually a slight rise as the delivery falls off and a fall of pressure if the delivery increases. This is shown in Figure 2.

If the delivery falls below approximately 50 percent of the rated capacity, the compressor will cease to deliver regularly and the discharge pressure will pulsate more or less rapidly. The delivery at this capacity is referred to as the "pumping limit" of the compressor and if the unit must operate below this value of delivery, other means must be provided to prevent the so-called pumping which would result.

This so-called pumping limit is the lower limit previously referred to where the compressor ceases to be self-regulating. The upper limit is that imposed only by the permissible fall of discharge pressure below the desired operating pressure.

At maximum capacity the usual backward-bladed impeller is most suitable for this service since the characteristic pressure volume relation is such that with increase of delivery the pressure falls off sufficiently to prevent overloading of the motor, in a manner similar to the centrifugal pump.

The pressure volume regulation as shown by the curve is also such that comparatively small changes of volume are accompanied by proportional changes in pressure, and for this reason two or more machines may be operated in parallel if desired with reasonable distribution of load between units. With the use of radial-bladed impellers the pressure

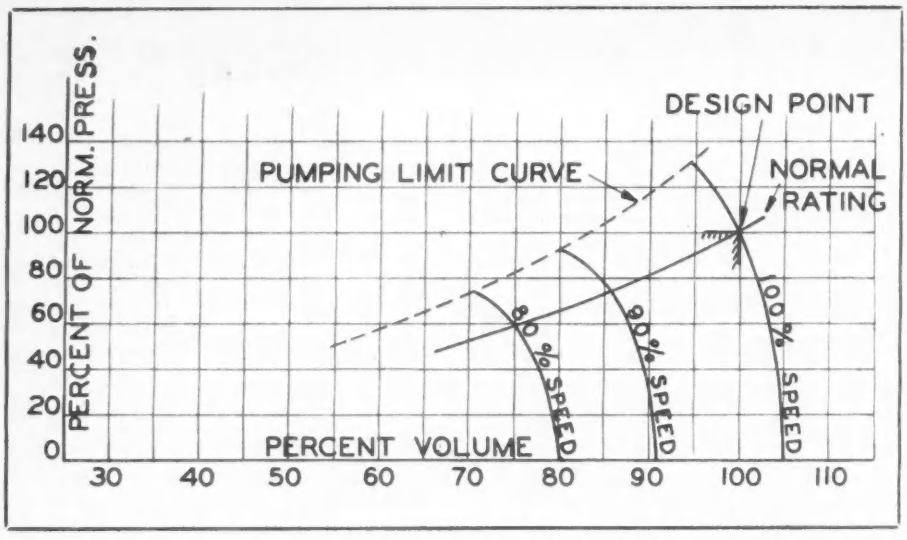


Figure 1. Pressure-volume curve for axial compressors.

change is very small with a given volume change; therefore, it would be difficult to operate this type machine in parallel as there would be the constant danger of one machine taking all the load.

Regulation

The capacity of centrifugal compressors may be varied in a number of ways:

1. By small speed variation. This, however, is limited, for constant pressure, to a minimum volume not greatly less than the pumping limit previously referred to. This method is the most efficient in power saving. The electrical control equipment for variable speed motor drive is, of course, quite expensive.

2. By throttling the inlet to the compressor. This has about the same limitation that the speed varying method has, but the power losses are larger.

3. By means of adjustable inlet guide vanes (pre-rotation). This method, in modern practice, usually involves the installation of adjustable turning vanes at the inlet of one or more stages of the compressor, the purpose of which is to impart an initial whirl to the gas as it enters the wheel, thus reducing the pressure rise through the impeller without the complete loss which would result from throttling the inlet, and at the same time permitting far greater reduction in capacity than can be obtained by straight throttling.

4. Power recovery means. In this method the excess compressed gas is passed through an expansion turbine and bypassed into the suction line of the compressor. This method saves power but requires added expensive mechanical equipment, thus adding to the first cost. The power recovery means is sometimes built into the compressor proper. This method provides very wide range in capacity with power saving features.

5. Regulation by reduction of delivery of compressors at producing field. Since the pressure ratio is dependent on the gas density, the capacity of the line may be varied by slowing down the field delivery to the main line. This will lower the pressure in the line and the booster compressors will operate at constant speed with the same inlet volume but a lower pressure rise; thus the capacity of the line in pounds of gas per day will be reduced.

6. Much the simplest means of regulation for operation below the pumping limit is the bypass method. In this

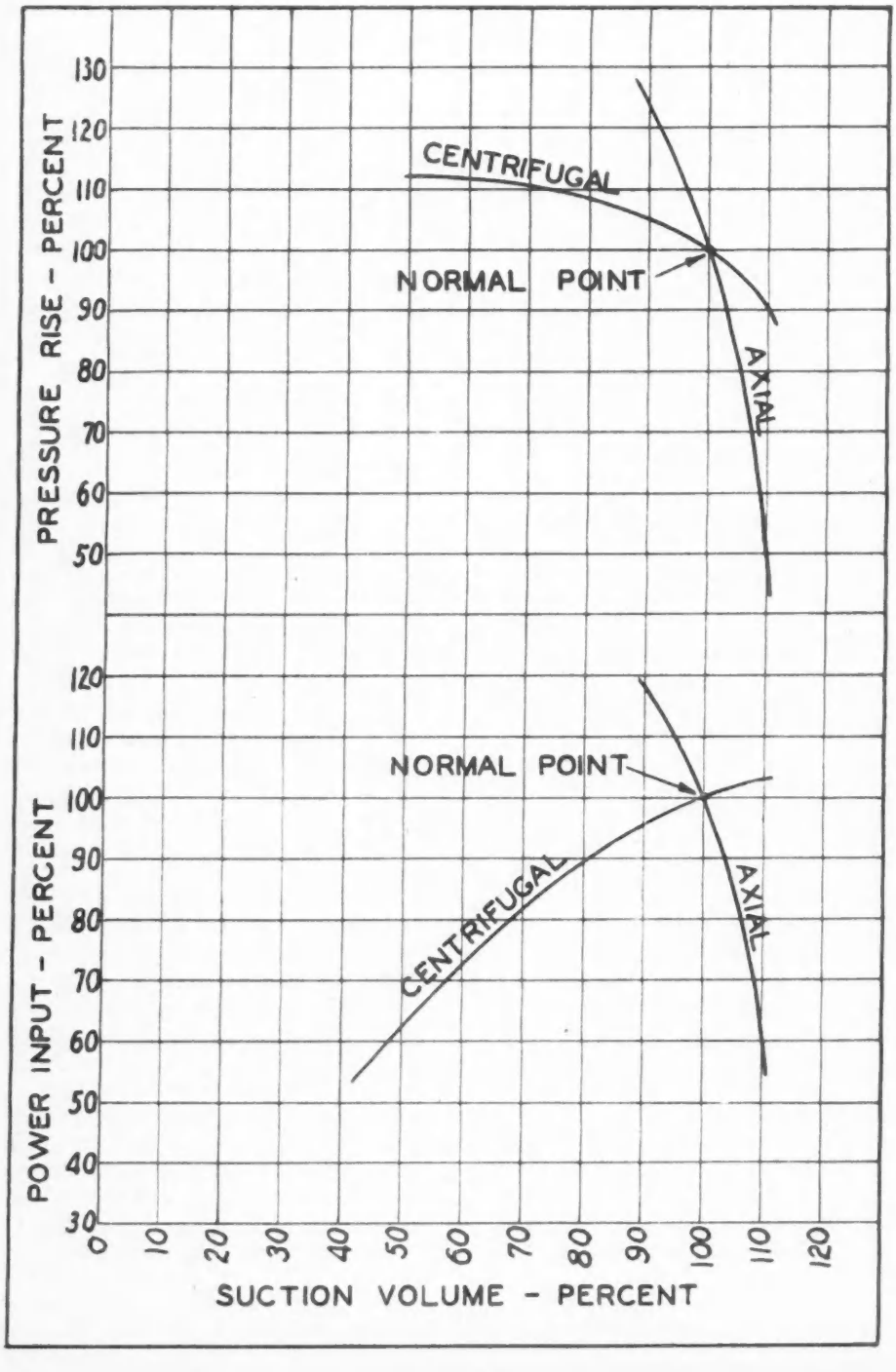
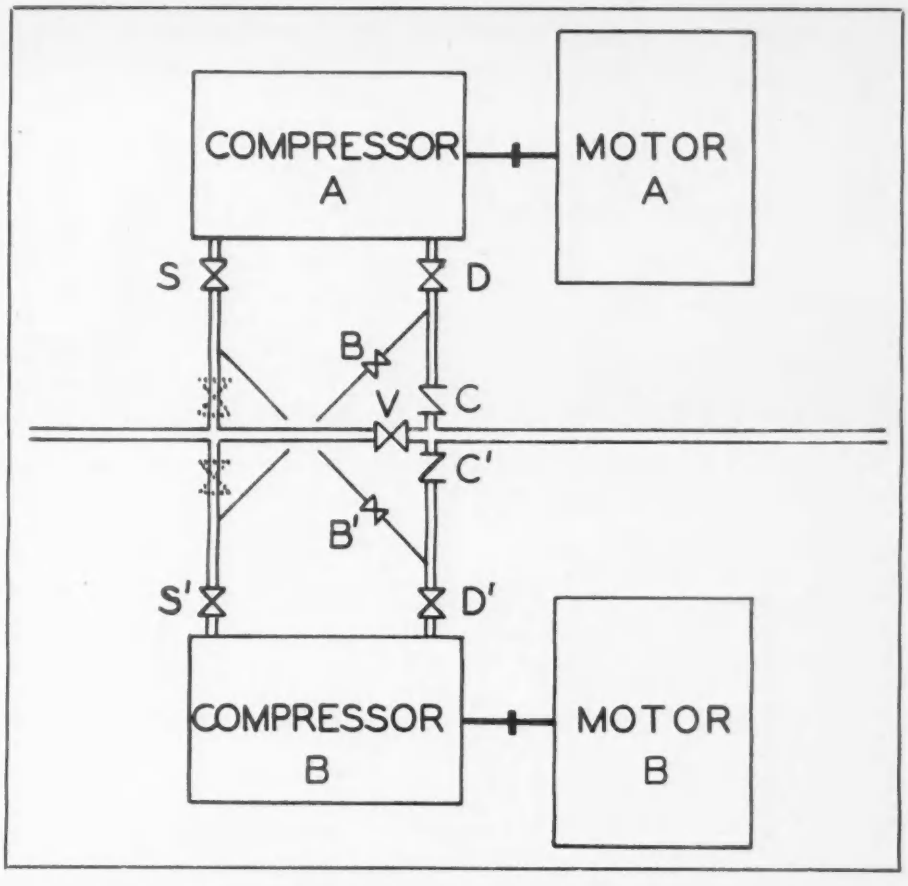


Figure 2. Performance curves for centrifugal and axial compressors.

Figure 3 (top). Hookup for operating units in parallel.



method an automatically controlled valve bypasses gas from the discharge to the suction in just sufficient amount to maintain stable operation above the pumping limit. This method is positive, reliable and simple, but naturally the energy used in compressing the bypassed gas is wasted and the method is not recommended where long periods of operation at much reduced capacities are encountered. Also, if considerable gas is bypassed for any length of time a cooler in the bypass line to remove heat of compression is advisable. This gas could be used for useful work but usually the amount is so small and irregular that it is not economical to attempt it.

Operation

Centrifugal compressors, in view of their inherent characteristics, probably will require that somewhat different installation and operating techniques be used. In the first place, a check valve or mechanically operated stop valve must be placed in the discharge line to prevent backward flow of the pipe line gas which would drive the blower backwards as a turbine at very high speed. A bypass arrangement also would be required to bring any unit onto the line in parallel with a unit already in service (Figure 3).

Centrifugal compressors should be started with a closed suction or discharge valve to reduce the starting load on the motor. The power input when operating at full speed and no delivery is about 30 percent of the full load power and the discharge pressure will be about 85 percent of the maximum pressure at the pumping limit condition. Normally, this will be lower than the rated operating pressure; therefore, in paralleling a unit the incoming machine must have a bypass connection to permit it to deliver at least 60 percent of its capacity through the bypass valve. After the unit is up to speed the bypass valve can be closed, whereupon the pressure will rise to the existing line pressure and the machine will come on the line. The line characteristics should be carefully considered in the design to be certain that line pressures are such as to permit proper starting conditions.

To avoid an excessive temperature rise in the bypass gas, which would reduce the pressure rise in the machine, the

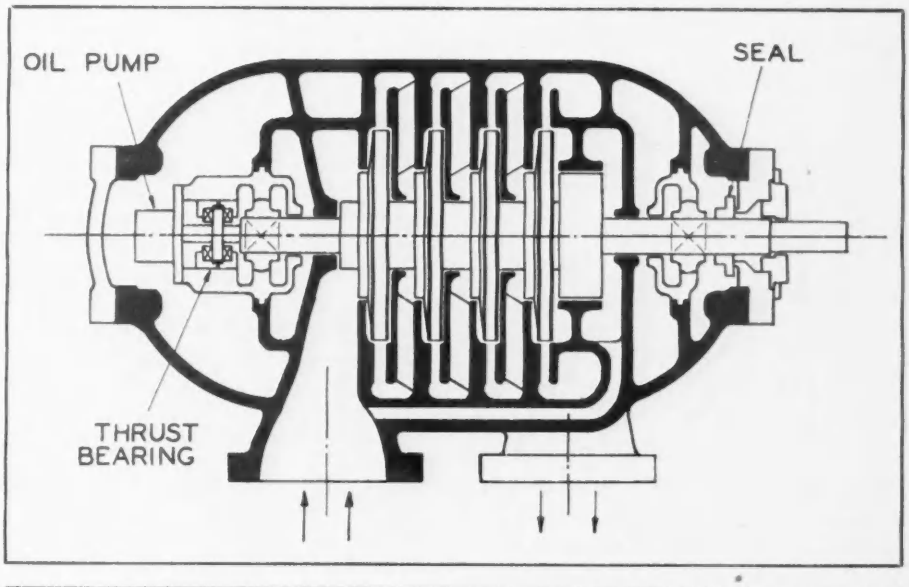


Figure 4 (center). Cross-section of enclosed multi-stage centrifugal compressor with single, full pressure shaft seal.

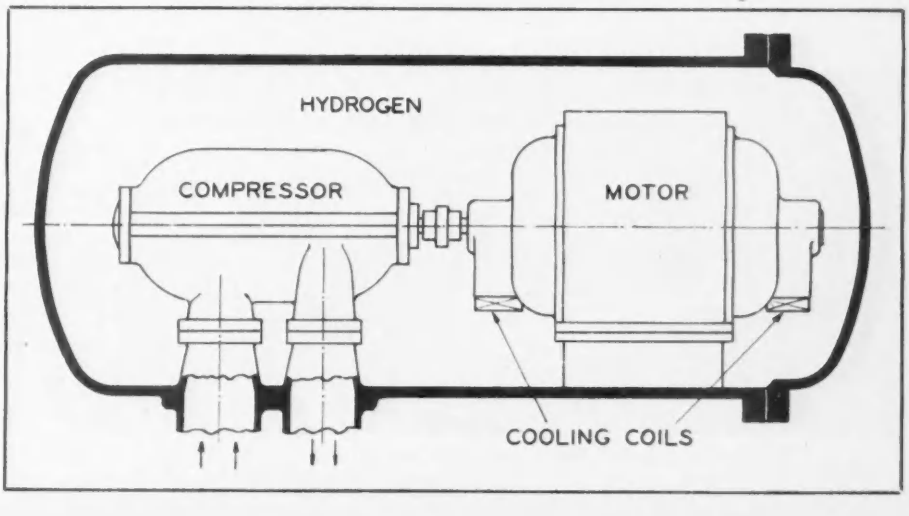


Figure 5 (below). Sealed unit.

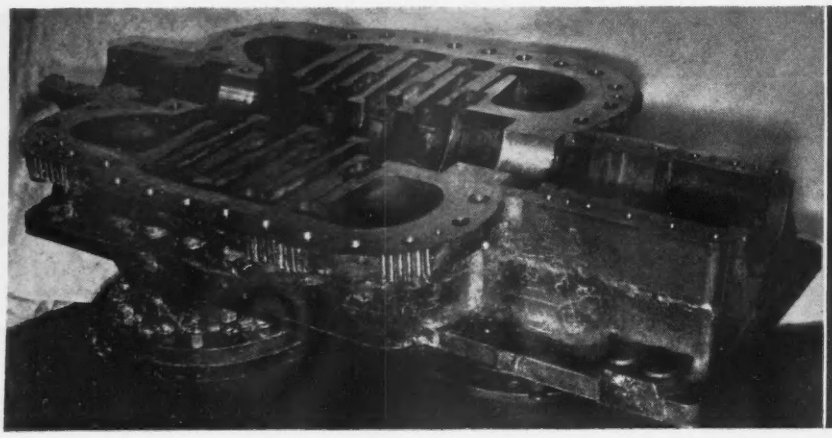


Figure 6. Lower half casing of centrifugal compressor for 350 pounds per square inch pressure.

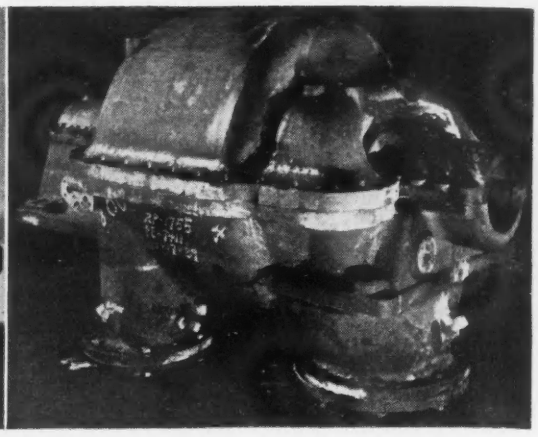


Figure 7. Casing of centrifugal compressor for 350 pounds per square inch pressure.

piping (Figure 3) is so arranged that the gas which is pumped through the starting machine is delivered to the suction line of the machine in operation. This will assure a constant supply of cool gas to the unit being started.

The steps required to bring the idle unit on the line (Figure 3) would be as follows:

A. Conditions at start.
   1. Unit "A" operating.
   2. Unit "B" idle.
   3. Valves S and D open.
   4. Check valve C open by gas flow.
   5. All other valves closed.

B. Operational steps for bringing unit B on the line.
   1. Open valves B¹ and D¹.
   2. Start motor B (unit B).
   3. Open valve S¹.
   4. Close valve B¹. Units will now operate in parallel.
   5. If necessary Unit A may be stopped. Check valve C will prevent any back flow after unit "A" has slowed down to the point where insufficient pressure is developed.
   6. Valves S and D may be closed and Unit A is ready to be serviced after blowing down.

If it is desired to have the two units on one station operate in series (in case the previous station is completely out) it can be accomplished by having the by-pass lines made full size and the valves S and S¹ (suction line valves) installed outside the by-pass connection, as indicated by the dotted valves on Figure 3. The operation (for Unit "A" first stage and Unit "B" second stage) would be as follows:

1. Valves S, D, B and D¹ open.
2. Check valve C¹ will be open by gas flow.
3. Valves V, S¹ and B¹ closed.
4. Check valve C will be closed by gas pressure.

After the line is in full operation the compressors should be self-regulating from somewhat over rated capacity to between 50 percent and 60 percent of rated capacity. If the demand at the delivery end of the line decreases while the supply at the field end is maintained, the line pressure will rise slightly due to the shape of the characteristic pressure-volume curve, and the power for compression will be accordingly reduced. If the demand decreases below 60 percent of the compressor capacity, the machine must be cut off or some of the previously discussed methods may be used to prevent pumping.

If the demand decreases but stays within the pumping limit of the machine, the control stations may be called upon for regulation to prevent a pressure surge from building up to a dangerously high level. This can be done by any capacity control provided or by cutting out the required percentage of stations at equal intervals.

Lubrication

Lubrication must be protected against interruption by any cause. This would require a positive circulating means for regular service plus an emergency storage device to supply oil to bearings and seals while emergency measures are being put into effect or the unit comes to a standstill. The form of lubrication facilities will vary with the type of installation, but preferably should include a lube oil circulating pump driven from the main unit plus an electric motor driven standby or auxiliary and supplemented by the emergency storage apparatus referred to above. Means should be provided to keep the lubricating oil always under suction pressure or atmospheric pressure to avoid undue foaming due to absorption of gas being handled by the compressor.

The usual design for centrifugal compressors involves a shaft passing through both ends of the compressor cylinder. Leakage obviously must be prevented at these points. Some compressors are so arranged that the shaft passes through the cylinder at one end only. With the single shaft seal and multi-stage design

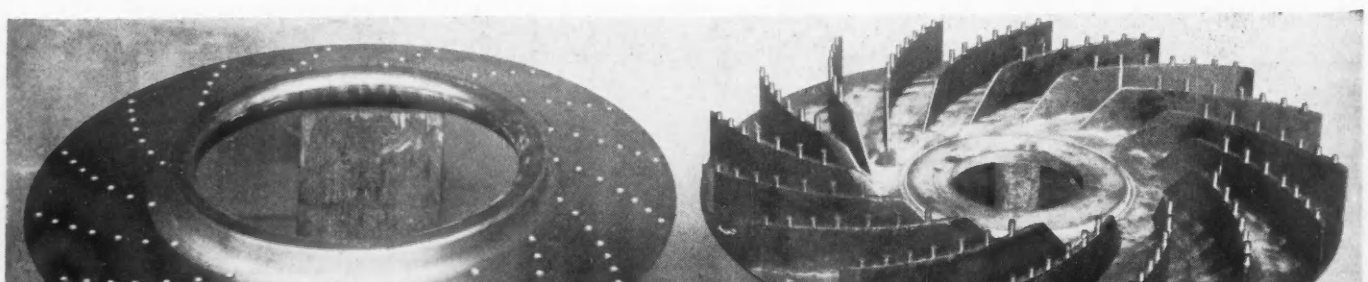


Figure 8. Impeller construction.

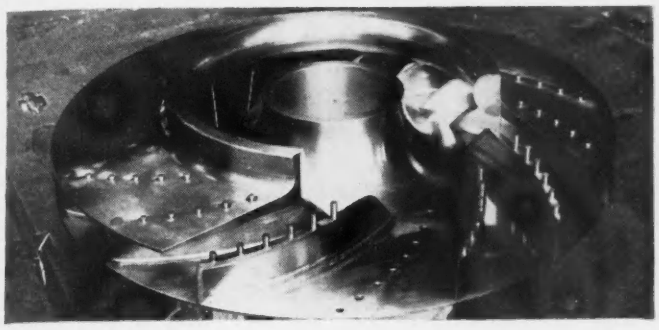


Figure 9. Impeller construction.

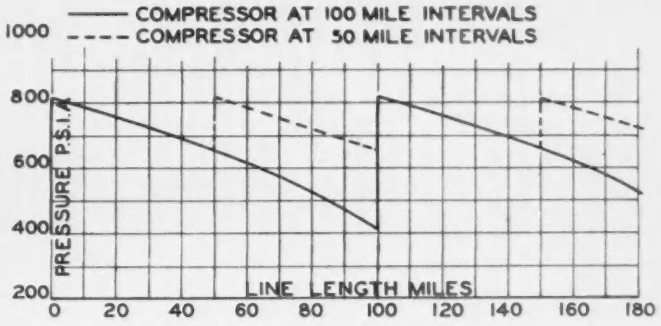


Figure 10. Pressure along 24-inch pipe line at 265 Mcfd natural gas.

it is necessary to mount the bearings and the lubricating system inside the compressor casing under an ambient pressure substantially equal to the intake pressure of the unit (Figure 4). Many small compressors are built with a hermetically sealed motor or with the motor completely enclosed and operating in an atmosphere of the circulating medium and at the pressure of the gas being compressed, thus requiring no high pressure shaft seal (Figure 5).

The shaft seal is an absolutely vital part of the equipment and for the very high pressures involved is a very difficult engineering problem, since the rubbing speed of the shaft is far too high to permit the use of anything approaching the conventional stuffing box. The shaft seal previously has been a stumbling block in the application of centrifugal machines to this particular service. It is the opinion of the authors that the problem can be solved without the necessity of building complete full-scale compressors. A seal development program could be executed so as to arrive at the proper seal proportions for practical application, and this same program would serve to demonstrate the feasibility and reliability. Such a program of demonstration would be relatively simple in principle.

Perhaps the starting point should be a construction in which no seals, or at least very simple seals, are necessary. This would, obviously, indicate a motor and compressor completely enclosed in the pipe line and cooled by the gas stream passing the motor (Figure 5). This could be varied by installing a seal on the shaft between the motor and the compressor, or designed into the compressor, and supplying a desirable gas (substantially equal to the suction pressure) to the motor compartment. This arrangement would make the pressure drop across the seal very low, making it mechanically an easier problem and the loss of gas (possibly hydrogen) could easily be kept at a minimum. The use of inert gas such as hydrogen would reduce the windage losses in the motor to a very considerable extent. From the electrical standpoint this seems to be practical as the insulation would not be adversely affected and cooling of the motor would be improved. The main difficulty would be accessibility for inspection and repair plus the compression and regulating equipment for the cooling of the inert gas. For this type of application a brushless motor (induction) is essential.

With the perfection of the seal to operate satisfactorily at a pressure differential of 650 psi, a design such as indicated by Figure 4 could be considered. This design would require the bearings to operate at suction gas conditions. A possible danger would be the loss of oil to the gas stream. The service oil pump would be a standard lubricating oil pump supplying the oil only at a small pressure differential (10-20 psi) required for positive bearing lubrication. This pump would be driven directly from the compressor shaft. In addition to this service pump, a scavenging pump would be required to pick up, at atmospheric pressure, all oil which leaks through the seal and deliver it to the oil sump which is at suction pressure (about 650 psi).

If it is desired to keep the bearings in atmospheric air and one atmosphere pressure, this can be done with the use of two seals, one at each end of the compressor and inside of the bearings. This design will not require a scavenging oil pump but will require a pump to supply oil to the seals at a pressure slightly above suction pressure (650 psia) at all times.

Materials of Construction

The standard materials used in commercial centrifugal compressors should be satisfactory for this service. These would comprise cast steel for the compressor cylinder, heat treated alloy steel for the impellers or possibly straight 12½ percent chromium steel if particularly corrosive conditions are encountered. Journal bearing linings would be substantially pure tin babbitt with steel shells. Interstage labyrinth seals would be the 18-8 stainless steel now in use for this purpose.

Figures 6 and 7 are views of typical casings which were designed for operating pressures up to 350 psi. Figures 8 and 9 show some details of typical impeller construction.

All cost factors herein mentioned are estimates based upon the conversion of the "Big Inch," 24-inch line to natural gas transportation at a rated capacity of 265 MMcfd, and an average yearly load factor of 75 percent.

For the gas-engine driven reciprocating compressors the present state of the art would dictate the installation of a station at intervals of 100 miles. This would require units for a compression ratio of 2/1; suction pressure 408 psia and discharge pressure 815 psia, requiring about 12,000 hp per 100 miles. The electric motor driven, centrifugal compressor at 50-mile intervals would operate at a compression ratio of 1.25/1; suction pressure 650 psia and discharge pressure 815 psia. This would require about 3500 hp per station, or 7000 hp per 100 miles (Figure 10.)

The cost of the centrifugal pumping station would be about 0.15 to 0.25 million dollars, depending upon the reserve capacity provided in the installation. This would be 0.30 to 0.50 million dollars per 100 miles of pipe line. This type of installation is particularly feasible where electric power lines are already available.

The operating costs for the above two types of installation would be comparable at 75 percent average annual load. At lower load factors the electric motor driven centrifugal machines would prove more economical while at higher average annual load factors the gas engine driven reciprocating compressors would prove more economical in operation.

Due to the great reduction in equipment and material needed with the use of centrifugal machines the initial cost (where power is available) is considerably less than that required for reciprocating machines. At load factors which are in line with practical experience, the operating costs of the two types of installation are about equal.

This study is too limited to draw final conclusions; however, it does indicate that the further investigation of centrifugal compressors for "big inch" lines, if used for natural gas transportation, is warranted. The required seal development program would be a good investment particularly in the face of recent experience with modern seal design.

METEOROLOGICAL ENGINEERING

AND THE OIL INDUSTRY

Part 2

SINCE many areas of the world where oil may be found are not easily accessible by surface transportation, the use of air transportation for supply purposes is frequently economical. This is particularly true for preliminary operations. In addition to the use of aircraft for supply, photographic or magnetometer surveys have been made from the air and, in the future, other types of aerial exploration may be developed. At the present time, the success or failure of aerial operations is largely dependent upon weather conditions.

During the war, many techniques were developed to eliminate the weather risk in aerial operations. Briefly summarized, the usual approach to such a problem consisted of: (1) the determination, by the use of climatological data in long-range planning, of the possible times of the year and the possible routes over which a given aerial operation might be completed; and (2) the short range forecast of the best day and/or best route for the operation. The first step eliminated from consideration those seasons or routes for which aerial operations were impossible or dangerous. In the cases where all seasons of the year or all routes were considered dangerous, the operation could be dropped from consideration, or if essential, could be protected against failure in other ways. However, over most regions of the world where flying is impossible or extremely dangerous during one season, it may be quite safe during some other season. For example, flight conditions in western Burma are abominable during summer when the southwest monsoonal winds sweep up the mountains. During winter, however, flight conditions are generally excellent. Obviously such information would be a valuable aid to anyone planning aerial exploration or supply projects in Burma where large sums of money are involved. Figure 6, a graphical presentation of this type of information, shows the maximum and minimum frequency of closed (ceiling less than 500 feet or visibility less than one mile at points along the route) flying conditions (non-operational conditions) for each month of the year over the air routes from Columbus, Ohio, to Chicago, Boston, and Eglin Field, Florida.

If supply operations between Columbus and Chicago are being planned, it is desirable to select the most favorable season so that supplies may be transported most efficiently. Figure 6 shows that winter is the least favorable time of the year with two to five non-operational days a month, and summer is the most favorable time with not more than one non-operational day a month. That the summer season is most favorable for flying in the U. S. is not a very startling conclusion, but little weather "horse sense" is available in foreign areas, and a chart of this type is quite valuable. This may also be used for quantitative estimates of the tonnage which may be shipped by air. With a given number and type of aircraft and a given route, the number of trips and tonnage flown monthly can be estimated assuming perfect weather conditions. Then that figure can be reduced by the percentage frequency of anticipated unfavorable weather conditions during the period of operations.

Sometimes a major problem in the selection of air routes is the choice of an airfield where there are several possibilities. It is quite important that the airfield selected have the highest frequency of weather conditions favorable for takeoff and landing. Figure 7 shows how climatological data which will solve such problems may be prepared for the planner. The charts give, for each of five bases in the northeastern U. S., the percentage of frequencies of contact, instrument, and closed weather conditions. The limits of these classifications are shown on the legend, but for qualitative purposes it may be stated that closed weather conditions are those which prevent takeoff and landing conditions; and contact conditions represent safe landing and takeoff conditions. As a sample of how this chart may be used, suppose a summer aerial supply project is planned between bases in the northeastern U. S. and a forward base in north central Canada. As far as distance is concerned, any one of these bases is usable but it can be seen by inspection of the chart that, during the summer, the base at Presque Isle has a higher frequency

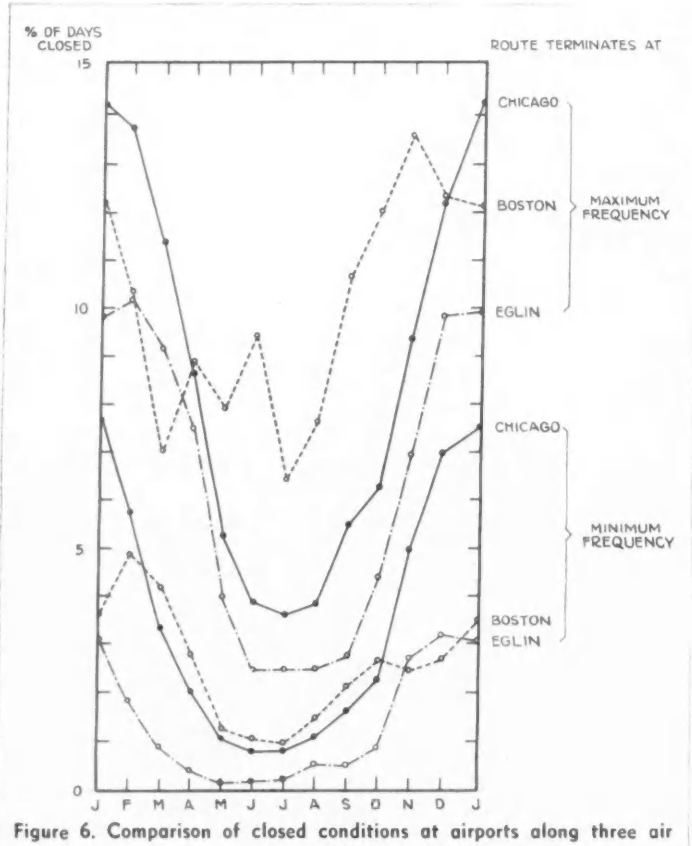


Figure 6. Comparison of closed conditions at airports along three air routes.

By C. C. BATES
and
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of favorable weather for takeoff and landing than any of the other airfields. If regular shipments of fuel, casing, explosives, lubricants, and food must be moved to the forward base, this consideration is important. Data on the frequency of contact, instrument, and closed conditions are available for a large number of bases all over the world. Where accurate frequency data are not available, reasonable estimates of this quantity can be made by the meteorological engineer.

Where air transportation is considered, the important weather factors are flyability of the route and terminal weather conditions for takeoff and landing. In the case of aerial exploration, however, there may be other important considerations. For example, in aerial photography it is not enough to be able to take off, fly to and from the area to be photographed, and land. In addition, the cloud cover below the aircraft must be sufficiently sparse that the final result is predominately a land rather than a cloud photograph. In planning an aerial photography project, therefore, one is interested in knowing the season of the year when least cloud cover may be expected over an area to be photographed, and approximately how many favorable days may be expected during this season. Figure 8, a graphical summary of a study of the months most favorable for aerial photography over South America and the Caribbean, shows how such information may be presented. The usual criterion for a favorable day for aerial photography is a total cloud cover below the aircraft of less than .2. In this particular case data which gave the frequency of occurrence of clouds by elevations were not available. However, the aircraft were to fly at an altitude of 20,000 feet and since most of the clouds form and remain at altitudes lower than 20,000 feet, it was considered sufficiently accurate to determine the frequency of days with a total cloud coverage of .2 or less. When all available data were summarized, the map was prepared to show simultaneously: (1) the months with the greatest number of clear days in the order of clarity, (2) the average total number of clear days expected annually, and (3) the percentage of the average annual number of clear days which occurred in the three clearest months.

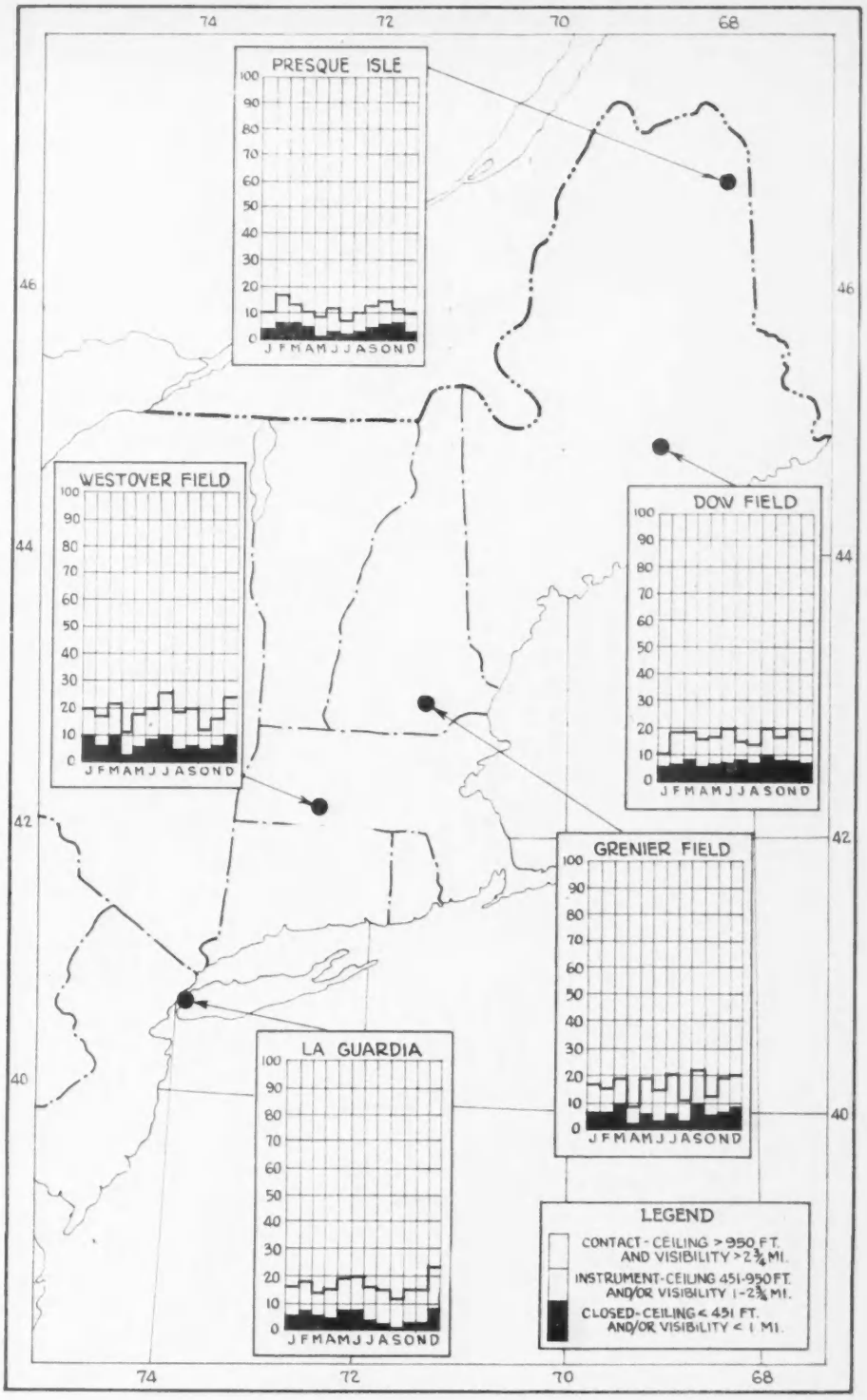
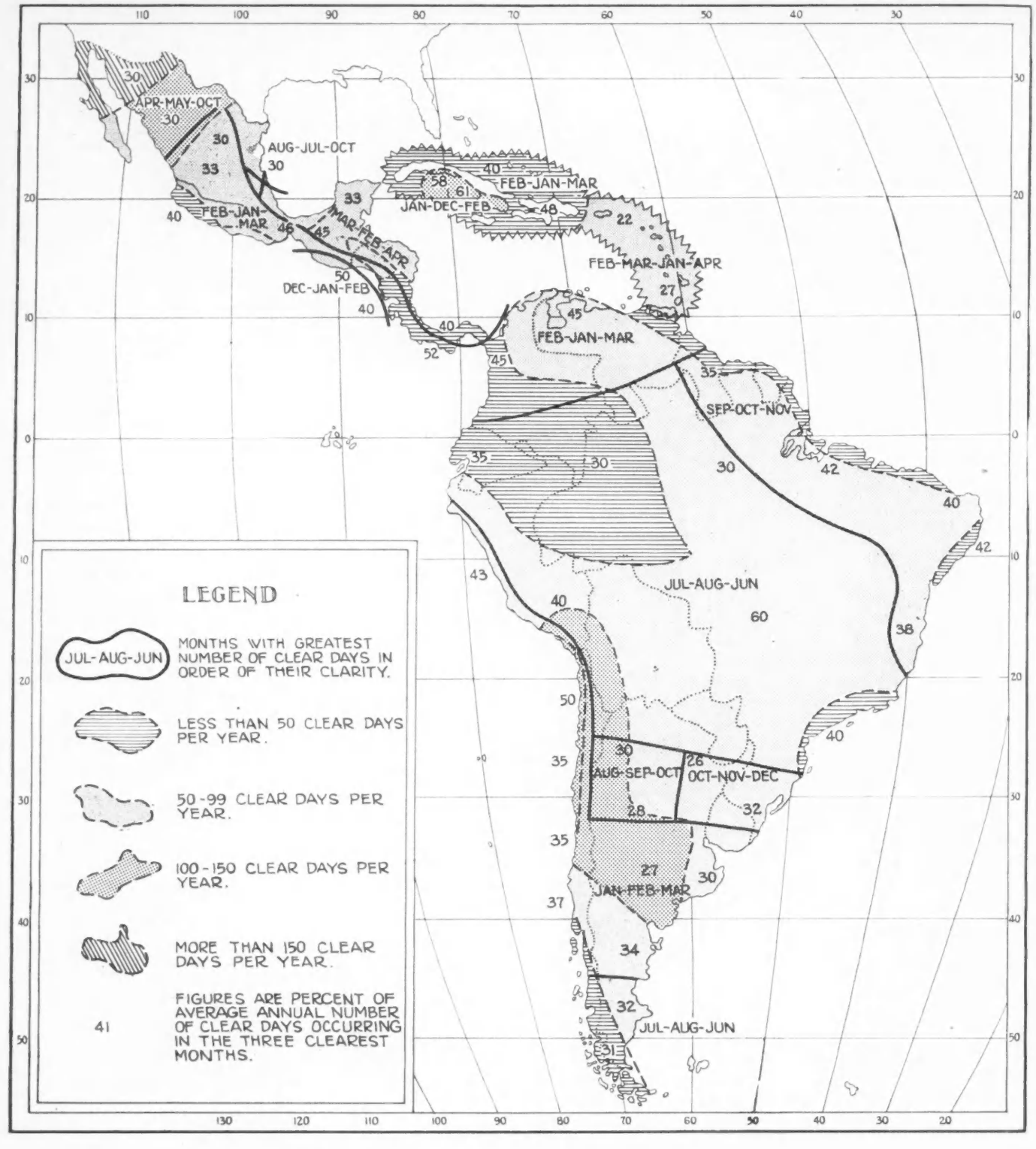


Figure 7. Percentage of hourly observations with contact, instrument, or closed weather conditions.

Suppose that an aerial photography project is being planned for the western Amazon Valley. This map tells the planner that (1) July, August, and June, in that order, are the most favorable months; (2) less than 50 clear days can be expected annually on the average; and (3) about 30 percent of the year's clear days will occur in June, July, and August. Use of such data in planning is a considerable improvement over a hit-or-miss method which might result in an attempt to conduct an aerial photography project in the area at the height of the cloudy season.

Snow and foliage cover also affect the success of an aerial photographic project by obscuring ground features important in the interpretation of photographs. Data concerning the duration and depth of snow cover for various regions of the world are available. The meteorological engineer can collaborate



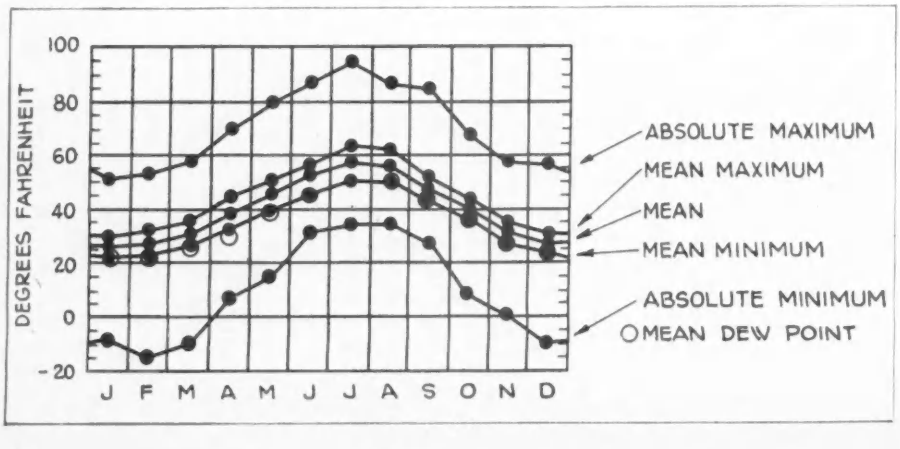


Figure 8 (above). Days with mean cloudiness of 0.2 or less over South America.

Figure 9 (left) Temperature and dewpoint data for Trondheim, Norway.

with the botanist to attack the foliage cover problem.

Location and Utilization of Installations

The solution of many detailed problems connected with the location and utilization of installations depends in part on climatic conditions. Climatic conditions in any particular region of the world are usually known in general terms; hot, wet conditions are anticipated in the Netherlands East Indies, and cold, dry climatic conditions in north central Canada. But within these definitions of hot and wet or cold and dry there exist many variations. Knowledge of these variations within a selected region can aid in eliminating the element of chance in the planning of a project.

Certain phases of work are directly or indirectly influenced by surface temperature, precipitation, humidity, and surface winds. For example, temperature affects soil trafficability, the required viscosity of machine lubricants, the type of clothing and shelter required for personnel, the amount of fuel required for heating and operating machinery, the type of cooling or air-conditioning devices required, anti-freeze requirements and other protection against freezing temperatures, the efficiency of labor, the location of structures to avoid temperature extremes, the carrying capacity of pipe lines in which high viscosity fluids are transported, and the mass transport in pipe lines conducting gaseous products.

Figures 9 and 10 show how temperature data may be summarized graphically for use in planning. These data are for Trondheim, Norway, which is on the Atlantic coast at approximately 63° N. The mean maximum and mean minimum temperatures indicate the average daily range of temperature. In March, for example, the average highest temperature during the day is 37° F. and the average lowest during the night is 26° F. The mean maximum and minimum temperature data are useful where approximate answers to planning problems are sufficient, e.g., the estimation of fuel and lubricant requirements. The absolute maximum and minimum temperature represent the extremes recorded over the entire period of record. Where delicate or expensive equipment must be protected, the extreme temperature data are useful. These data may show, for instance, that an instrument which may be damaged by low temperatures must be protected down to -15° F. in the winter months.

If high viscosity fluids are to be transported by pipe line, low temperatures will result in reduction in flow. If low temperatures occur frequently, provision to maintain the liquid temperature above

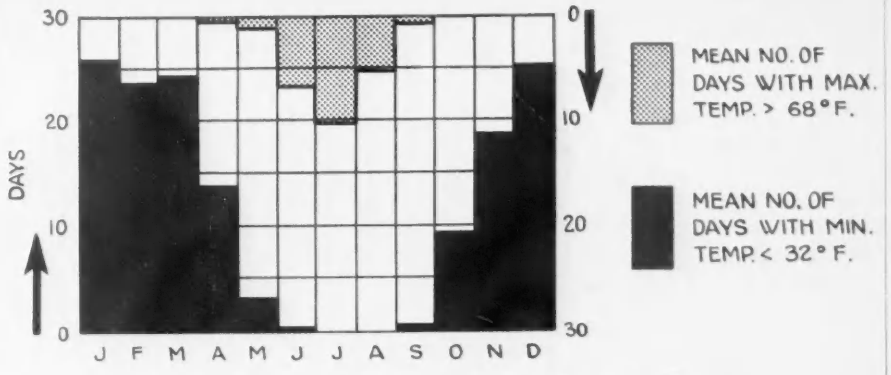


Figure 10. Frequency of temperature levels at Trondheim, Norway.

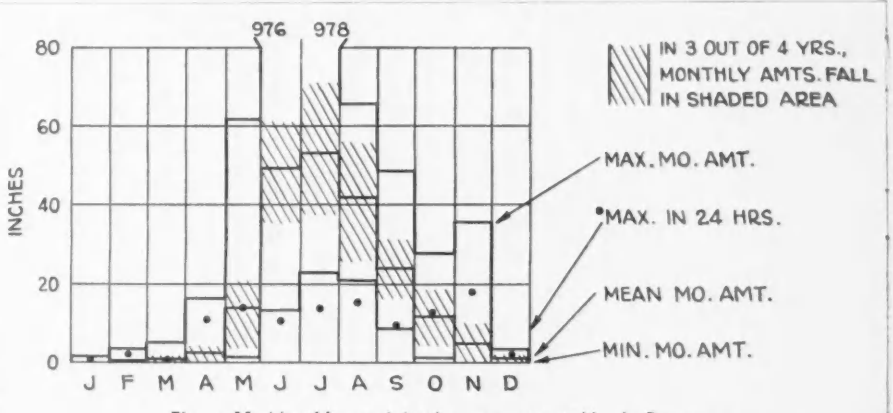


Figure 11. Monthly precipitation amounts at Akyab, Burma.

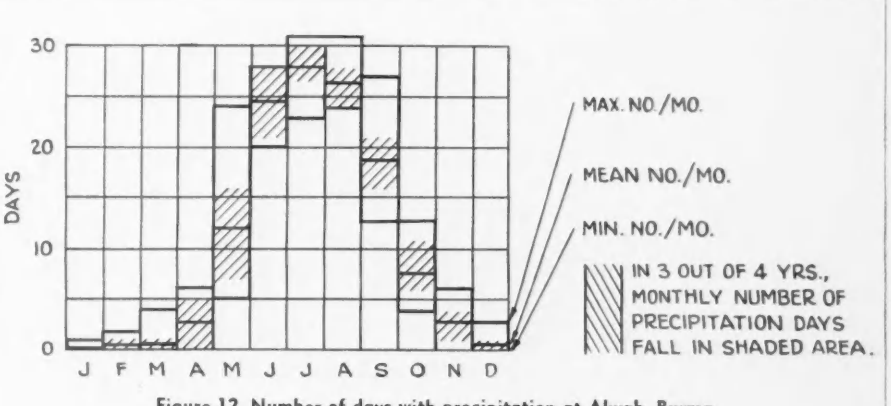


Figure 12. Number of days with precipitation at Akyab, Burma.

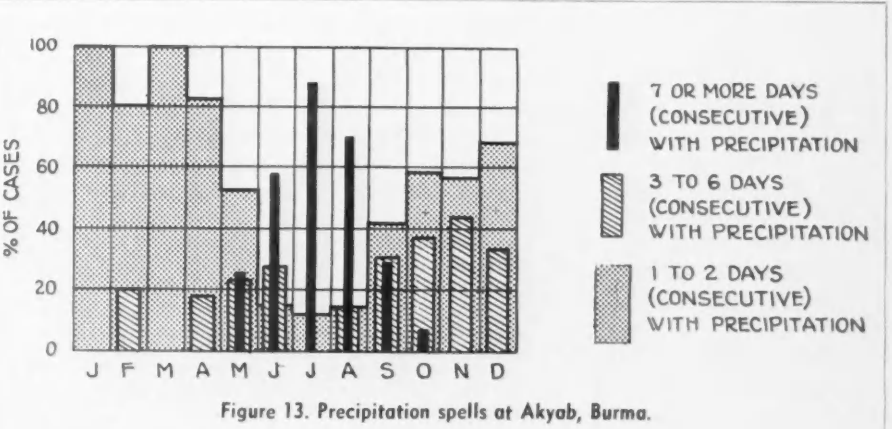


Figure 13. Precipitation spells at Akyab, Burma.

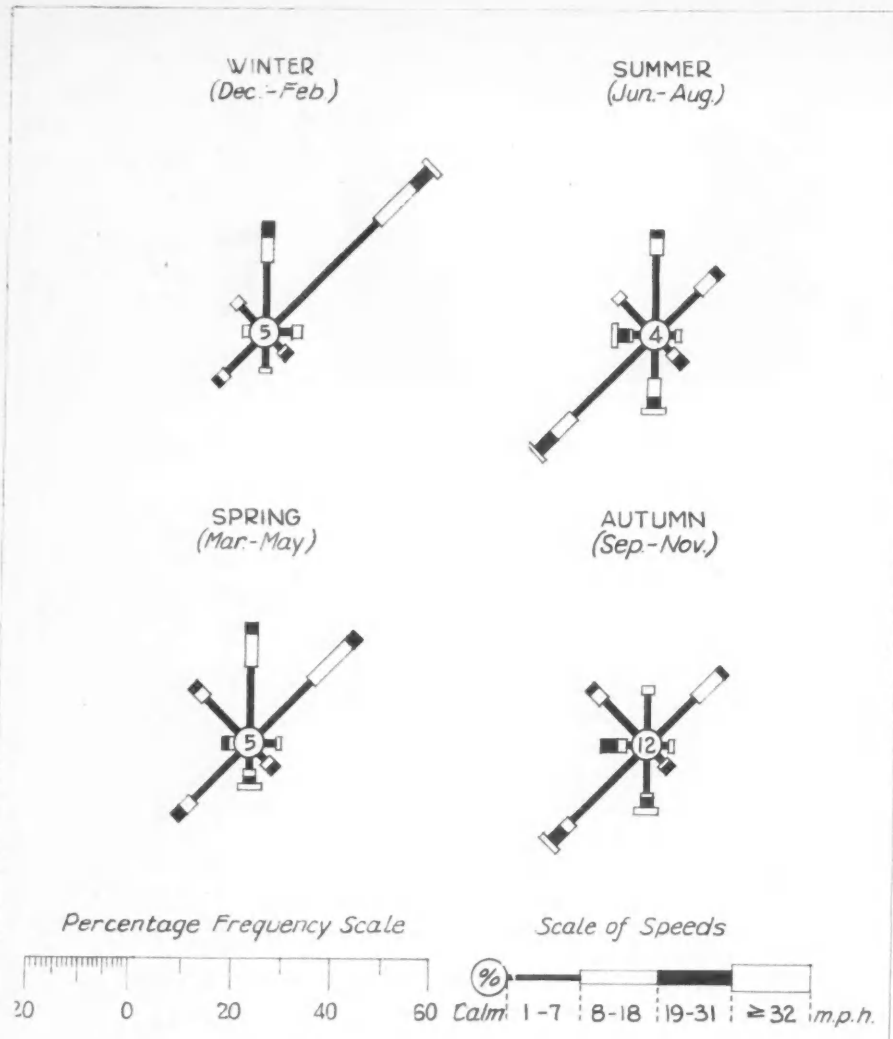


Figure 14. Surface wind roses at Victoria Town, British North Borneo.

the air temperature may be accomplished by jacketing the line or burying it to a depth where higher temperatures prevail. The depth to which the pipe must be buried to prevent a drop in the liquid temperature below a specified value can be determined from temperature, snow cover and soil data. A comparison between excavation costs and cost of jacketing the pipe line is then possible, permitting maximum economy in construction.

Another example of the application of temperature data is in estimation of transportation of gaseous products by pipe line. Low temperatures result in increased density of the gas and consequent greater mass transport for a given velocity of flow. With data giving the expectancy of certain temperature ranges slightly above, at, and below the earth's surface. The mass transport can be estimated (in effect the B.T.U. transport for fuel gases) for the pipe line at various levels. This factor may then be included in the determination of the most economical design.

Precipitation affects soil trafficability, drainage requirements, availability of fresh water supply, number of efficient working days per month, fire hazards, design of structures to resist snow or ice loads and possible hail damage, and protection of equipment and personnel from rain or snow.

Figures 11 to 13 show the precipitation to be expected at Akyab, Burma, on the Bay of Bengal. The monsoon climate of this locality is such that surface or aerial operations can be carried out only at prohibitive cost during the summer months. However, conditions during the winter months are excellent. This is quite evident from inspection of the figures. Figure 11 shows that monthly rainfalls of one to two inches are the greatest that have been recorded during the winter months, whereas amounts of 40 to 60 inches monthly can be expected in three out of four years during the summer, and monthly rainfalls as great as 100 inches might be encountered in June or July.

Figure 12 shows that rain in amounts greater than 0.01 inch can be expected practically every day during the summer, while more than three rainy days a month in the winter never have been recorded. Note that there is a rapid increase in both total rainfall and number of rainy days in May. Knowing this, it is evident that a project which must be discontinued in the event of rainy weather should be completed in April to prevent possible complete shutdown until October.

Figure 13 shows how often rainfall spells of various lengths may be expected. In January 100 percent of the rainy spells are only of one or two days' duration. Thus a shutdown resulting from inclement weather will not continue for long. However, in July almost 90 percent of the precipitation occurs in spells lasting seven or more days and the remainder of the precipitation ocurs in spells lasting from three to six days.

Humidity affects the rate of corrosion of metal parts and the rate of decay of organic materials, the deterioration of deliquescent chemicals, the condensation of water vapor in storage tanks, the growth of fungi which may damage delicate instruments, the rate of leakoff of dangerous static electrical charges near oil storage tanks, and the dust problem. The mean dew point data of Figure 9 give an indirect indication of the humidities to be expected. When the dew point equals the air temperature, the air is saturated and the relative humidity is 100 percent. The mean dew points are nearly equal to the mean minimum temperatures, indicating that the relative humidity is high and the climate is wet. Much more complete humidity data than are shown here can be obtained when necessary.

Wind Data

Surface winds affect the design of structures, the precautions which must be taken to prevent wind damage, and dust conditions. Winds aloft affect the rate and direction of dispersal of waste gases.

Figure 14 summarizes surface wind data for Victoria Town on Labuan Island off the coast of northwest Borneo. These wind rises show the frequency of occurrences of various velocity groups by direction. This figure indicates that the frequency of winds which might damage structures is small. Less than 10 percent of the observations show wind velocities greater than 32 miles per hour. Since high wind velocities are uncommon and the greatest frequencies occur in the one to sevent mph velocity group, living quarters, hospitals or office buildings should be located in places exposed to the northeast and southwest winds so as to offset partially the un-

■ CONTINUED ON PAGE 52

Ease and comfort and peace of mind—fruits of company pension plans which today are being enjoyed by thousands of retired oil industry employes.

Bareco PENSION PLAN

By C. E. VOTRIAN
Vice President and Treasurer, Bareco Oil Co., Tulsa

EVERY business organization is eventually faced with the problem of ageing employes whose efficiency and ability become impaired but who are not financially able to retire. Through a pension plan, superannuated employes with years of service may be retired at a comfortable allowance instead of being retained at a salary for more than they are worth. Moreover, a systematic retirement plan accelerates and assures the promotion of younger men in the organization.

A systematic pension plan permits the employer to accumulate over a period of years the sums needed for comfortable retirement of his employes. Both employers and employes realize that the present benefits provided under the Social Security Act are inadequate for retirement.

From the viewpoint of an employer there are many good reasons for a pension or group annuity plan. Those reasons may be summarized as follows.

1. Reward to his employes for years of faithful service.
2. Desirable method of providing for older employes not financially able to retire.
3. Improved general employe morale.
4. Reduced labor turnover and fewer strikes.
5. Making possible a means of systematic savings for employes leaving the company before reaching retirement age.
6. Greater effort in younger employes.
7. Income tax deduction if the plan meets the requirements of the U. S. Treasury Department. Tax savings can pay a generous share of the cost of an approved plan.

Details of Plan

The writer has been a member of a company pension plan which has been in existence since 1934 and has seen the many benefits to the members during the last 13 years. One hundred percent of eligible employes are members. Since the plan may contain features of interest to other companies it is herewith briefly described.

Normal Retirement Age

Males—65 years.

Females—55 years.

Eligibility for Membership

All regular employes, after completing six months of service, who have not reached their 65th birthday, if men, or 55th birthday, if women.

Retirement Pension Limits

50 percent of current salary.

To reduce clerical work, employe members are classified by salary groups, with a spread of $25 between the low and high in each classification.

Employe Monthly Contributions

Four percent salary bracket by payroll deduction for members prior to Federal Social Security Law, effective January 1, 1937.

Two percent of salary bracket for first $3000 annual earning, plus five percent salary above $3000 for employes entering plan after Social Security Act.

Employer Monthly Contributions

Difference between total cost and employe contribution for each individual member based on age for each employe member.

Pension Credits Purchased by Combined Contributions of Employe and Employer

Two percent of salary for each policy year of membership not to exceed a total of 50 percent of current salary.

One percent of salary for first $3000 earning for employes entering plan after effective date of Social Security Act, plus two percent of salary in excess of $3000 annual earnings.

Prior Service Pension Credits

Employe members who were too old at the time the plan became effective to build up the maximum pension credit of 50 percent of salary before reaching retirement age will receive a paid-up pension credit not to exceed six years, based on salary at time plan became effective, at no cost to the employe. Prior service pension credits are in the form of paid-up pension certificates issued in the employe's name and are in addition to pension credits for current service before reaching retirement age.

Death Benefits Before Retirement Age

If a member of the plan dies before reaching retirement age his beneficiary will receive a death benefit equal to 20

times his monthly salary to the nearest $500.

The maximum amount of death benefit is $10,000.

Permanent Total Disability Benefit

If an employe becomes totally and permanently disabled prior to age 60 and while a member of the plan, he will receive in installments an amount equal to the death benefits on his life at the commencement of disability.

Installments will commence six months after proof of permanent total disability in the amount of $18 per month for each $1000 of insurance on his life. The minimum monthly installment shall be $27.

EXAMPLE: $5000 insurance—$90 per month (5x$18).

Forms of Pension Available on Reaching Retirement Age

(65 years for males—55 for females).

Forms of Pension

When an employe reaches pension age he may elect in writing one of the following forms of pensions:

No. 1—*Maximum Pension:* Two percent of salary for each year's membership, with a maximum of 50 percent of salary. This form of pension is usually chosen by an employe with no dependents, since the pension payments stop at the death of the employe.

EXAMPLE: Salary $200—Pension $100 after 25 years membership.

No. 2—*Protection of Employe Savings:* Under this option a slightly reduced pension is payable monthly as long as employe lives, but if he should die before receiving pension payments equal to his cash value at the date of retirement the balance would be paid to his beneficiary in a lump sum.

EXAMPLE: Salary—$200 a month.
Employe contribution—$8 per month for 25 years, or a total of $2400.
Cash value at age 65, $3391.68.
Pension—$98.52 per month.
Payment received at time of death,
25 payments of $98.52 ..... $2463.00
Payment to beneficiary 828.68
Total $3391.68

No. 3—*Protection of Wife:* This option provides a reduced pension of $93.50 as long as both employe and wife are alive, with one-half of the pension being continued to survivor as long as he or she may live.

EXAMPLE: Salary—$200 per month.
Pension—$93.50 to both employe and wife during their lives.
Pension—$46.75 to survivor for his or her life.

Note: Above based on both husband and wife being the same age. If wife is younger, pension payments are reduced.

Pension Before Retirement Age

An employe may be pensioned before normal pension age at a reduced pension with the consent, or at the request of the employer. His pension payments would be determined by years of service plus prior service benefits, if any, and age at time of retirement.

Guarantee of Plan

If the plan is discontinued for any reason, any money that has been paid to the insurance company by the employer to provide pensions will be held by the insurance company to provide such pensions and will not be subject to return to employer.

Vested Interest in Payments Made By Employer

If a member leaves the company for any reason after 20 years of continuous active service, he will be credited with all pension purchased by his contributions and by the company contributions, unless the employe withdraws his cash contributions.

The company contributions can be received in the form of pension only, and are not available to the member who withdraws his cash contributions at termination of service, or at a later date.

If a Member Leaves Before Being Pensioned

Employes leaving before reaching pension age have a choice of one of the following options:

A. Receive the cash value of his contributions to the plan, plus interest after the first four years of membership.
B. Receive a paid-up pension policy, with payment beginning at pension age, which his contributions has purchased. (He does not receive any benefits from the employer's contributions which are credited back to the employer.)
C. Continue his contributions directly to the insurance company if he has taken a paid-up policy on leaving the company.
D. The employe also has the privilege of converting the life insurance, without a medical examination, into any of the regular policies issued by the insurance company, excepting term insurance. The amount of life insurance that can be converted is the excess of his death benefit over the cash value of his contributions to the plan.
E. If a member leaves after 20 years of service for any reason, before reaching retirement age, he has earned a vested interest in the employer's contribution and can elect to receive a paid-up pension certificate purchased by his contributions and by the employer's contributions for him.

Service After Pension Age

With the consent of the employer, an employe may continue working after reaching retirement age, but his contributions to the pension plan will stop and his pension payments start as if he had retired.

Temporary Absence of Employe

If a member of the plan is temporarily absent from work but continues to receive salary or wages, his contributions will be deducted and his pension credits will accumulate as if he were at work.

If a member is temporarily absent from work and he receives no salary or wages, his contributions will cease and he will receive no pension credits during the period of his absence.

A member of the plan may not withdraw his contributions in whole or in part so long as he remains in the employ of the company.

Income Tax Provisions—Employe

Contributions by an employer to a qualified pension plan do not constitute taxable income to the employe when made, unless they are used to provide life insurance protection.

The employe does not start to pay tax until he receives payments under the plan or until benefits are made available to him. This is an obvious tax advantage to the employe. After retirement the employe might have no income except his pension and his social security benefits.

When an employe receives pension payments, the portion purchased by the employer's contributions, if any, is taxable income to the employe.

The pension payments purchased by employe contributions are subject to the

About the Author

C. E. VOTRIAN, vice president and treasurer of Bareco Oil Company, Tulsa, has made an intensive study of pension retirement plans and his analysis of the subject has won him recognition as an authority on this phase of management. He frequently addresses company groups as well as organizations in connection with retirement plans and believes that their adoption in industry goes far to solve such problems as labor turnover and the question of security which plays a big part in the ultimate satisfaction of the employe with his job. Votrian was born in O'Fallon, Ill., and attended McKendry College in Lebanon, Ill. He formerly was on the staff of Ernst & Ernst, accounting firm of St. Louis, Mo., and went to Tulsa in 1921 to audit the books of the Bigheart Oil & Refining Company when that organization was taken over by Barnsdall Oil Company, and has remained in Tulsa since then. He has been an Oklahoma Certified Public Accountant since 1924.

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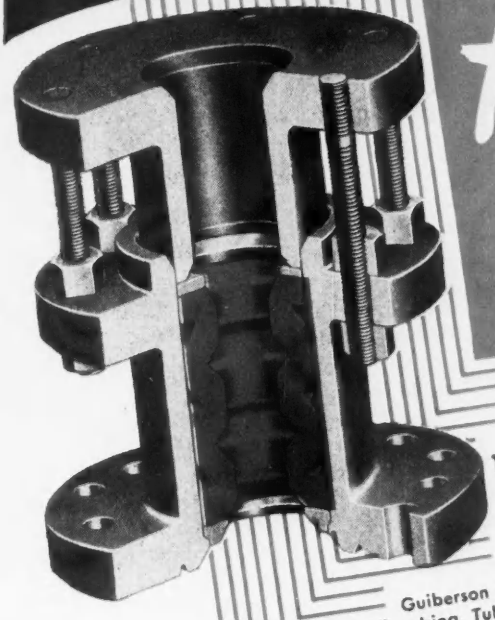
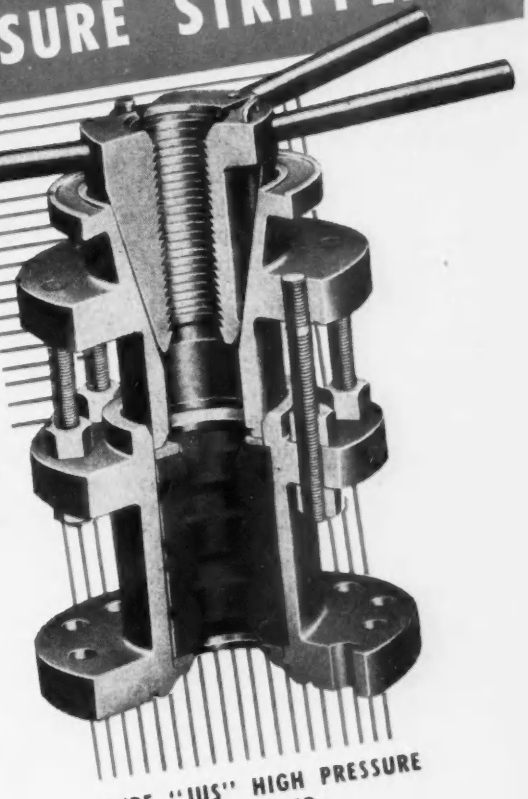


TYPE "JU" HIGH PRESSURE STRIPPER

Compact with a minimum of parts. Flat top of packing gland enables operator to use standard tubing. Tubing load is transmitted to stripper housing through six 1⅛" alloy steel stud bolts, which also serve as the packing rubber adjustment. The "JU" Stripper is made for tubing sizes of 1¼"*, 2", 2½" or 3" and can be furnished with 6" series 400, 600 and 900 or 8" series 400 bottom flange.

*1¼" rubber also packs off ¾", 1" and 1½" pipe, tubing and couplings.



TYPE "JUS" HIGH PRESSURE STRIPPER

With the same general construction as Type "JU", the "JUS" Stripper has a slip bowl made integral with the packing gland, providing a compact tubing spider arrangement with minimum overall height. Slip bowl made to receive Guiberson Type "B" Heavy Duty Tubing Spider Slips. Unique in design, the Guiberson unitized slips assure true fit in the bowl regardless of their vertical position and prevent sticking — they are extremely light, easy to handle and compact. The "JUS" Stripper comes with slip sizes of 1", 1¼", 1½", 2", 2½" or 3".

For running and pulling tubing under pressure, for clean-out work using reverse circulation, for any work where an inexpensive, dependable, non-rotating high pressure stripper is needed—Guiberson High Pressure Strippers are the ideal tools. Engineered for simplicity and speed in operation, Guiberson strippers come in two types, with or without slips. Specially designed accordion shaped packing rubber gives heavy duty service and a perfect seal-off around tubing under either low or high pressure. Pack-off rubber can be inserted or removed without dismantling stripper. Packing gland has 3" adjustment for different pipe sizes and taking up rubber wear. Tubing can be rotated and collars can easily pass through the rubber without leakage.

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three percent of cost rule. Only 3 percent of his cost is taxed each year and the balance is tax free. When the tax-free portions of all payments received equal the employe cost the pension payments from then on are fully taxable.

EXAMPLE:

Employe total contributions		$4000.00
Pension per year purchased by employe contribution	$2120.00	
Taxable income, three percent of $4000...	120.00	
Tax-free income—1st year	$2000.00	
Tax-free income—2nd year	$2000.00	
Tax-free ($2,000 plus $2,000) equals employe total contributions of	$4000.00	$4000.00

Entire persion received each year thereafter is taxable, including pension purchased by employer contributions.

Methods of Financing Pension Plans

Before establishing a retirement plan careful consideration should be given to the present and future methods of financing in order to avoid unnecessary modifications in the future.

Funds required to finance a pension plan can be provided by one of two general methods—unfunded methods or funded methods.

Unfunded methods make no provision for segregation of assets from control of the employer. Pension payments are made when required out of general funds of the employer.

A reserve account must be established on the books of the employer in arbitrary sums or in relation to net profits, gross payrolls, or upon actuarial estimates.

The majority of pension plans are financed by funded methods or in one or more of the following ways:

A. "A third-party contract" with an insurance company in the form of:

1. A group annuity contract, or
2. A series of individual annuity contracts based on the respective lives of each of the members, or a combination of both methods.

B. "A pension trust" which is invested in one or more of the following:

1. Securities or other similar assets to form a trust fund.
2. Individual annuity contracts on the life of each member.
3. A group annuity contract.

In funded methods the amounts necessary to cover the cost of future pensions are segregated from control of the employer and are usually accumulated during the years in which productive services are rendered.

Meteorological Engineering And the Oil Industry

■ CONTINUED FROM PAGE 45

comfortable tropical climate of this location. Wind data summarized in this fashion are useful in designing landing fields, determining the type and strength of equipment to be used for protection against winds, and selecting the optimum layout for structures.

Airstrips are normally oriented along the direction of the prevailing winds when only one strip is to be built. The purpose of this is to make maximum use of winds in taking off with heavy loads and to minimize the frequency of cross winds. Exceptions to this occur when the prevailing winds are so light in velocity as to be negligible, in which case the single strip should be oriented in the direction of the strongest winds which occur. At Labuan Island an airstrip should be oriented between southwest and south and northeast and north as far as wind considerations are concerned.

Winds of possible destructive force (greater than 32 mph) can be expected infrequently from the northeast during the winter, between south and west in autumn, and from the south and southwest in spring and summer. Bracing of structures against strong winds from other directions will be unnecessary.

The disposal of offensive or corrosive waste gases and smoke products is a difficult problem, particularly in densely populated regions. The manner in which the waste products are moved, horizontally and vertically, away from the exhausts or stacks depends upon the wind at various levels, the turbulence in the air, the stability of the atmosphere, and mixing processes between the air and the wastes. These factors can be evaluated for any specific location by the meteorological engineer.

Characteristics of storm affect the precautions which must be taken to prevent or minimize damage from hurricanes or typhoons, tornadoes, squalls or electrical storm. The characteristics and distribution of electrical storms are particularly important in the location of tank farms where fire hazard is great. Studies of thunderstorm distribution can be prepared using existing data. General studies of characteristics of electrical storms are now possible, and in the near future considerably more detailed information will be available when research studies now in progress are completed. Information on the type, frequency, and characteristics of destructive storms can be prepared for the planner.

Conclusion

This paper has presented a few examples of the utilization of meteorological engineering in the solution of planning and operational problems of the oil industry. There are many more problems whose solutions are partially dependent on environmental factors which can be accurately assessed by the meteorological engineer, in the planning stage, this means the determination of the frequency of occurrence of pertinent climatic conditions over long periods of time; in the operational stage, the forecast of environmental conditions in the immediate future. The application of meteorological engineering in the oil industry can partically eliminate weather risks which were formerly considered unpredictable "acts of God."

Unfortunately, a bibliography of standard texts suitable for solving the problems of meteorological engineering cannot be listed, for the "reference book" of the meteorological engineer is the vast amout of original data assembled by weather agencies all over the world and compiled on approximately 150 million punched cards designed for machine summarization. Experience has shown that problems rarely arise which can be solved satisfactorily by the use of charts, tables, or explanations available in climatological texts. The variety and complexity in the type of problems encountered requires an unique solution in each case.

Acknowledgments

All figures used in this paper with the exception of those appearing in the section entitled "Marine Construction and Drilling" were obtained from reports prepared by Headquarters, Air Weather Service, U. S. Army Air Forces, and are reprinted here by permission of Col. Donald N. Yates, Chief, Air Weather Service. Figure 4 was obtained from Report No. 50 by Scripps Institution of Oceanography, which was prepared under a contract with the Hydrographic Office and the Bureau of Ships of the Navy Department. The authors wish to thank Dr. Woodrow C. Jacobs and Don L. Carroll for valuable suggestions in writing the paper and Mrs. Nancy B. Blumenstock for valuable assistance in editing.

Fuel Economy Meet

Membership application forms for the Fuel Economy Conference of the World Power Conference to be held at The Hague, Holland, September 2-9, are available from the secretary at the British National Committee, 201-2 Grand Buildings, London, W. C. 2.

Excursions are being organized after the conference to inspect the Bataafsche Petroleum laboratories at Delft and Amsterdam.

Water Treating

FOR SECONDARY RECOVERY

Typical treating plant showing treating tanks. Capacity about 3000 barrels per day.

By PAUL DeLOZIER

Treat-Rite Chemical Co., Nowata, Okla.

WHEN water was first used as a method for secondary recovery of oil, operators believed it was necessary only to filter the water clear. Time and experience in the field have proved to most operators that this does not give the best results. They have found that such waters probably corroded their distribution lines or possibly formed a scale so rapidly that it retarded the flow of water through the lines, meters and even the sand into which the water was being injected. Even in Pennsylvania, where it was thought that there was perfect water for subsurface injection, there has been quite extensive research to find an ideal water for higher oil recovery with a minimum of expense to the operator.

There can be no certain method set for water treatment since waters from different localities have different chemical or mineral content. In northeast Oklahoma the only two major sources of water supply are surface water or that found (in or below) the Mississippi lime formation. This lime-water has proved quite expensive to use because of its corrosive qualities. One operator in that area went to considerable expense to use the lime water and then found it less expensive to treat the very turbid unstable Verdigris River water. The Verdigris River and its tributaries furnish a major part of the water used for secondary recovery in that area. The water is quite expensive to treat due to its high turbidity and at times high organic content. The turbidity can vary from 25 parts per million to more than 5000 parts per million overnight, a condition which requires frequent changing of the chemical feed.

Some operators have overcome a part of this trouble by building a reserve storage pond or ponds where they can mix their return water with the river water, thereby allowing time for excess turbidity to settle. This also gives a constant mix of return salt water. Even by this method, however, they cannot prevent the rapid growth of organisms in the stored water, demanding excessive use of an algaecide.

Designing of Plants and Chemical Treatment

When water flooding was started in northeastern Oklahoma it was common practice to install expensive water treating plants such as are used in municipal and industrial plants with aerator, mechanical agitators, pressure-type filters, expensive chemical feeders and such. Most operators found that part of this expense could be overcome by designing the plant to make use of equipment that might have been on the lease or could be purchased locally, thereby saving freight expense on heavy equipment which had to be shipped long distances.

The ordinary water treating plant in that area consists of a source of raw water, a treating tank, a settling tank, filters and clear water supply tanks. Where the soil will permit, earthen pits are now being used in some places with very good results for treating the water. If the project has been planned to extend over a period of several years, the whole plant can be built with concrete pits at no greater cost than the usual tank system. However, there would be no salvage value to a plant of this type except in the pumps and chemical feeder. This type plant could be built at ground level to prevent freezing such as may occur when using fresh water and with only a small fraction of return water.

Overloaded Treating Systems

Some operators build a small plant for a pilot flood with the intention that if it works they will enlarge their water treating plant when the water reaches the capacity of the plant. Very often, however, they neglect this as the production increases and more of their time is required. Consequently, the treating system is badly overloaded and cannot perform efficiently, causing excessive chemical costs and often an undertreated, unstable water is injected into the sand. The type of water to be treated determines the size of plant needed since some waters require more retention time than others. The retention time varies from four to eight hours, depending on time required for the coagulated material to settle. Sometimes a highly turbid water will treat out faster than a comparatively clear water with only a few parts per million turbidity. This is possibly due in part to a low alkalinity colloidal suspension, organic matter or a combination of these. The correct design of a water treating plant cannot be overemphasized. First, the water to be used should be analyzed to ascertain the length of time and the amount and kind or kinds of chemical to be used to bring the water to the desired condition. The plant should then be built to conform with the laboratory findings.

It is also best for the analyst to collect the samples in containers especially prepared for that purpose since samples can easily be contaminated in sampling. The pH (hydrogen ion) concentration of the sample should be taken at the source of supply since a very small

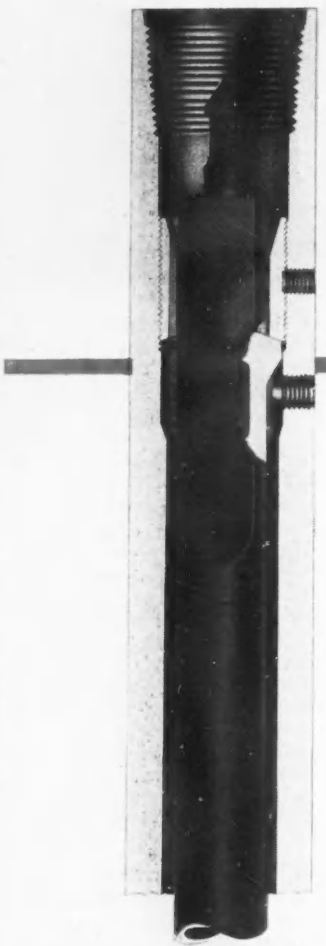
About the Author

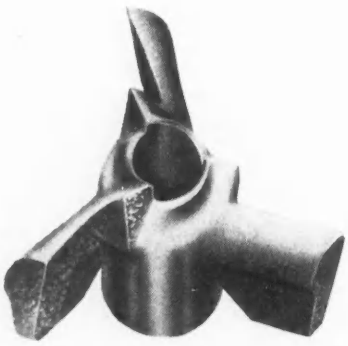
SECONDARY recovery work in general, and the chemistry which is an integral part of water flooding and related techniques in this phase of oil production have been the life work of the author, Paul DeLozier, manager of Treat-Rite Chemical Company, Inc. Nowata, Okla. He was born at Chelsea, Indian Territory, in 1906, and was educated at schools in Sapulpa and Chelsea, Okla. He has seen the peak production days of the many areas in northeastern Oklahoma and southeastern Kansas and came to maturity when these areas had passed their flush periods and operators were concerned with secondary recovery techniques. He started in the stripper areas of Rogers County, Oklahoma, in 1925 and in 1936 he joined H. J. Walter & Company. His experience includes secondary recovery operations with gas, air and water and he is considered by fellow operators as well qualified to discuss the problems contained in this paper.

NEW-IMPROVED

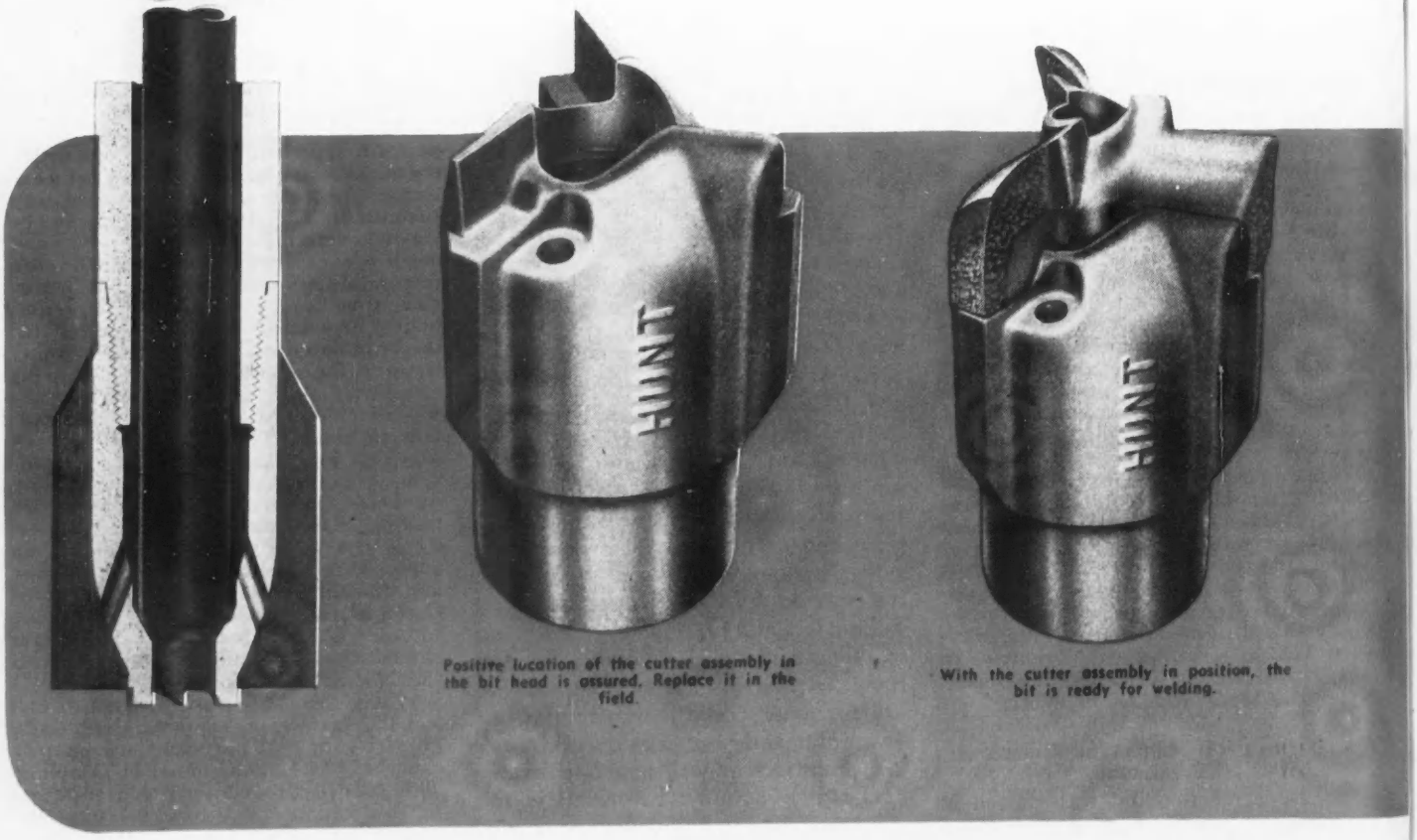
HUNT WIRE LINE CORE BARREL...

FASTER CORING



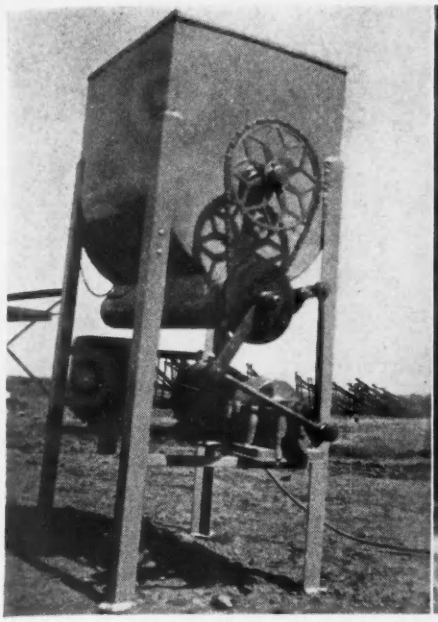


This new design Hunt Soft Formation Core Cutter Head and blades is a single unit with forged alloy steel heat treated blades. Replace it right in the field.

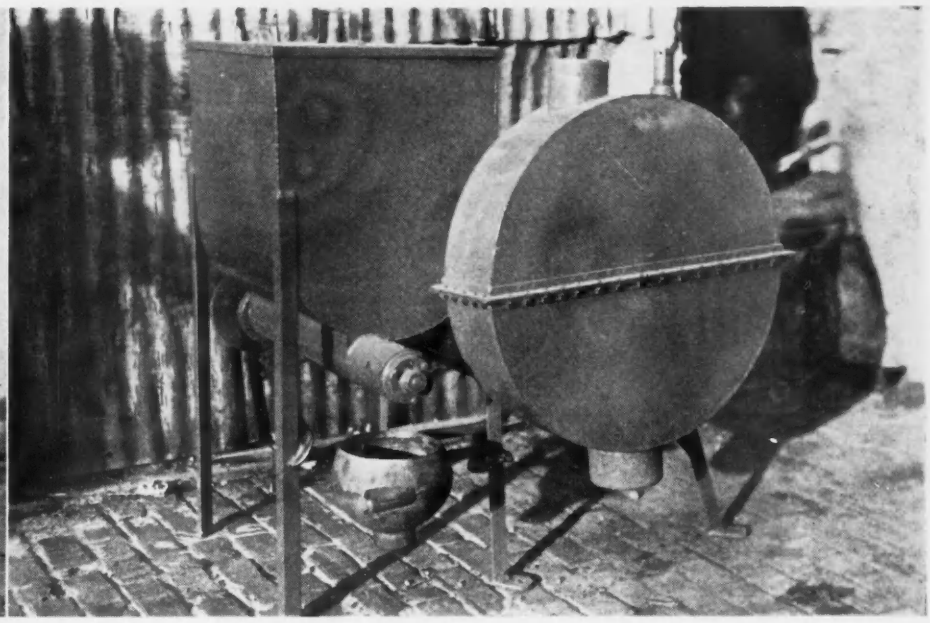


Positive location of the cutter assembly in the bit head is assured. Replace it in the field.

With the cutter assembly in position, the bit is ready for welding.



Electric chemical feeder generally used in northeastern Oklahoma water-floods.



Water-driven chemical feeder.

amount of oxygen absorbed or the release of carbonic or other gases can definitely change the pH value. For example, the sample could have a pH value of 6.9 (a slightly acid pH) when taken and a pH of 7.1 (a slight alkaline pH) when it reaches the testing laboratory. This pH control of flood water cannot be too strongly emphasized since it is proved that by adjusting the pH to a certain point corrosion can be eliminated and in some cases injection rates can be increased. At one plant in Nowata County, Oklahoma, where the power was furnished by electricity at a constant speed, several hundred barrels of water were bypassed daily at 500 pounds line pressure. After the chemical treatment was corrected and the pH held constant at 7.5, the bypass was almost completely eliminated without raising the line pressure. This definitely proved that the water that had been bypassed was going into the sand. This was confirmed by an increase in the metered water.

In some parts of Kansas there is a salt water sand which furnishes an abundant supply of salt water. This water is practically the same wherever it is found. It has low alkalinity and carries considerable ferrous iron in solution. A greater part of this ferrous iron will change to ferric iron with sufficient aeration. The other ferrous iron is economical to treat since the alkalinity is near the saturation point. This water has been used in enclosed systems with doubtful results.

Enclosed Systems

Concernnig the comparative merits of enclosed systems the writer is of the opinion that they are by no means the most economical method of flooding and this opinion is based on observed results of such systems in the Greenwood County, Kansas, waterflooding areas. Drawbacks to this type of system may be set forth as follows:

1. Expensive corrosive-proof equipment must be used.
2. Chemical or possibly physical change in the water caused by, possibly, a change of temperature, release of formation pressure by pumping, attack of water upon rods and tubing in supply wells and meters, possibility of air entering the system due to input wells taking at less than hydrostatic pressure (under vacuum).
3. Increasing corrosiveness of the water by mixing return water produced with the oil.
4. Expense of pumping return water into the system when it will not flow in by gravity; or building a treating plant for it.
5. Electrolytic corrosion is much greater in an untreated water than in a treated, stable water, especially where two different metals such as steel pipe and brass valves are joined together.

If any of the above conditions occurred, there would be expensive cleanout jobs on the input wells. Insurance is sold for protection and those who buy it hope it will never be needed. A good treating plant and well-treated water are the best insurance for a profitable water flood.

The Treating System

It is not always necessary to aerate the water used in flooding. When the supply is from a fresh water source, in most cases, in the areas under discussion, no appreciable amount of ferrous iron is in solution and therefore aeration is not required. In such cases aeration would be detrimental since excess oxygen would be absorbed, making the water more corrosive. This does not apply to salt water with high ferrous iron content. One of the aerators most commonly used in Oklahoma water-flood areas is the trough arrangement. This consists of a trough set in a level horizontal position so the water spills evenly over the edges and falls approximately 18 inches onto a splash board. This splash board helps to break the water into small drops, increasing the area exposed to the air. Most salt water cannot be over-aerated. This rule also applies to hydrogen sulfide waters sometimes used.

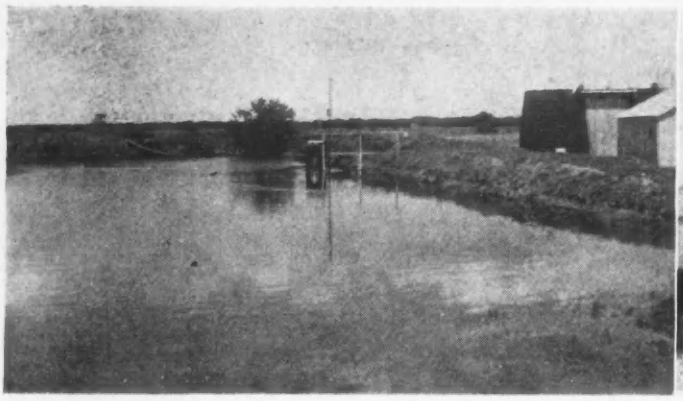
The size of the aerator is governed by the amount of water to be aerated. It is well to remember that air is free and that chemicals can be expensive when the air does the same job up to a certain point. A good method of determining proper aeration is to take the pH of the aerated water from the pit, then take a sample of the water and pour it from one clean vessel to another for several minutes and check the pH on this sample. If the pH does not rise, the water is properly aerated. After aeration and settling, the water is pumped to the top of the treating tank.

Treating Tank

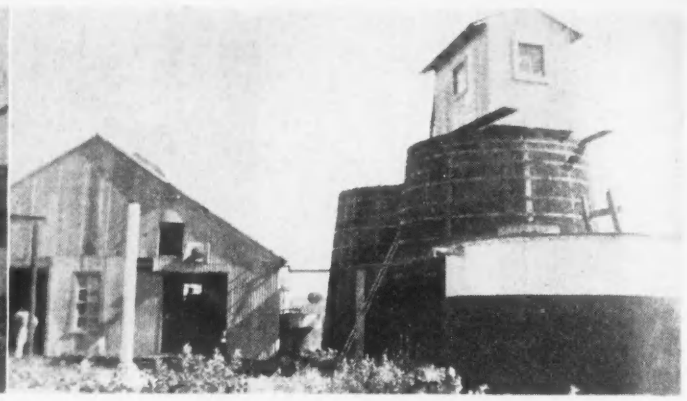
The treating tank is very important in a treating system. In this tank the chemical is mixed with the water and the chemical reaction takes place. This tank is usually divided into compartments, the first one being small with a baffle from the bottom to near the top. This compartment has a flume of wood or large diameter pipe extending from the top of the tank to near the bottom. All of the water entering the plant passes through this flume to the bottom of the tank. The chemical is fed into this flume and mixed with the water. Where the chemical reaction starts. Any chemical that does not go into solution immediately will be in constant contact with the incoming water until it does dissolve. The water then rises and passes over the baffle. The retention time in this compartment should be at least 30 minutes. The next compartment is made by building the baffle from the top to within two feet of the bottom of the tank. The water passes under this baffle and rises to the top of the tank to be collected by a skimmer at the top of the thank where it is carried over to the settling tank.

Chemical Feeders

The chemical feeder is a mechanical device used to feed the chemical or chemicals into the water entering the plant. It is usually set on top, over or near the flume on the treating tank. Several types of feeders are available. The one most widely used in northeastern Oklahoma is unique in that two models are made, one driven by the water entering the plant over a water wheel and requiring no other power for motivation, the other model being driven by elec-



Reserve storage pond for mixing return and river water to give constant mix and settle excessive turbidity.



Pressure plant, treating and clear tanks commonly used in water-flood operations in northeastern Oklahoma and southeastern Kansas.

tricity. The water wheel type is used on dump (or gravity) floods where the surface elevation permits making it possible for the water to gravity completely through the plant into the input wells. This eliminates pumping except for backwash a few minutes each day. This type of feeder is exceptionally good for this type of plant because when properly adjusted for a certain amount of chemical, an increase in the water rate automatically increases the chemical by the increase in the speed of the water wheel. Both models are adjustable to feed from a few to as much as 400 pounds per day.

Settling Tank

The settling tank is used to hold the water a sufficient time for the floc formed by the chemical reaction to settle. This tank should be built with a spreader on the incoming water line and a skimmer on the line going to the filters. There also should be a baffle in the center of the tank extending from the top to within two feet of the bottom. The water flows over the spreader, passes under the baffle and rises on the other side to be gathered by the skimmer. This arrangement uses a maximum of the tank capacity, eliminating dead water pockets such as are found when the water is introduced through pipe without the spreader and skimmer arrangement.

Both the treating and settling tanks should be built with a drawoff in the bottom so that sludge formed by the chemical may be drawn off as it accumulates. In several cases where this sludge was not drawn off the turbidity of the treated water going to the filter was greater than the incoming raw water. This sludge buildup in the bottom of the tanks increases the velocity of the water in the system.

Filters

The filter construction is one of the most important parts of the successful water flood. Operators too often overload this part of the plant. The filter, like any other piece of equipment, will not operate efficiently when overloaded. A rapid sand filter should not be compelled to handle more than three gallons of water per minute per square foot. Cleaning the sand bed of the filter by backwashing is also very important. The loss-of-head gauge on the pressure type, or the depth of water over the sand on the open-top type filter, determines when the filter needs backwashing. The minimum wash water rate should be 12 gallons of water per square foot per minute. When the rate of upward flow of water is too slow, the sand will not be cleaned. Too high a velocity of wash water will cause breaks in the layers of gravel supporting the sand bed and will decrease the efficiency of the filter. A filter should be backwashed until the effluent is almost as clear as the water used for backwashing. Centrifugal pumps usually are used for backwash since they deliver water at a high rate. Most of the water flooding operators in Oklahoma use the rapid sand (gravity type) filter containing a sand bed varying in thickness from 18 to 24 inches and supported by layers of graded gravel ranging from 1½ inches in the bottom to ⅛ inch directly under the sand bed. This sand and gravel should be fairly round and should be free of calcium carbonate (limestone) as this is soluble in water containing any appreciable amount of carbon dioxide. Sands with an effective size of from 0.50 to 1.0 millimeter are very satisfactory for filtration.

Clear Tanks

The clear tank, or tanks, should be of sufficient size to furnish water for injection with a reserve for backwashing in case it is necessary while the plant operator is away, or overnight, if only one operator is used. This tank should be decked so as to prevent sunlight from fostering organic growth.

Summary

Where an operator plans water flooding as a method of secondary recovery of oil, the following important factors should be considered:

1. Choose a constant supply of raw water.
2. Design and build the plant to handle this water in the best manner as determined by an analysis of the water.
3. Plan for enlarging flooding pattern which should also include the water treating plant.
4. Make sure at frequent intervals that the water is stable and satisfactory for injection by having laboratory tests made.

The author wishes to acknowledge the assistance of Mrs. J. L. Cowan, former manager of Treat-Rite Chemical Company for her assistance in preparation of this article.

Program Announced for Penn Grade Meet June 5

Discussions on secondary recovery, refining research and marketing will feature the twenty-third meeting of the Pennsylvania Grade Crude Oil Association at Hotel William Penn in Pittsburgh June 5.

D. T. Ring of Columbus, Ohio, association president, will preside.

Walter S. Hallanan, chairman of the National Petroleum Council and president of Plymouth Oil Company, will speak at the annual banquet while Dr. John W. Frey, director of marketing, American Petroleum Institute, will discuss "The Oil Marketer and His Industry" at the luncheon period.

Other speakers and their topics include:

Dr. Paul H. Price, Morgantown, West Virginia, state geologist, "The Future of Oil in West Virginia."

A. V. Bourque, Fred Eldean Organization, Inc., New York, public relations counsel, "Petroleum Is Progressive."

Roy A. Foulke, vice president, Dun & Bradstreet, Inc., New York, "The Economic Outlook for the Small Business Man."

Charles J. Wood, Chicago, partner in Harry P. Dunn Company, Pennsylvania oil marketers, "The Question—The Jobber."

Dr. Thomas C. Poulter of Chicago, associate director of Armour Research Foundation, "Association Activities at Armour Research Foundation."

Pressure Maintenance

Sun Oil Company was granted permission by the Texas Railroad Commission recently to install and operate a pressure maintenance plant in the Guerra field of Starr County, Texas. It is proposed that the plant will have an operating capacity of approximately 800,000 cubic feet and that some 280,000 feet of 285,000 produced daily will be injected.

SAE Handbook Issued

One-third thinner and a half-pound lighter, yet presenting 10 percent more text, the 1947 SAE Handbook published by the Society of Automotive Engineers makes available war-developed data and new standards plus material revised from 36 prior editions. Featured among new data are the first specifications for hydraulic brake fluids, standards for involute serrated shafts, nomenclature and definitions for three types of crankcase oil, standards for pipe, filler, and lubrication fittings, specifications for automotive steel castings, and general information on welding electrodes and on copper and silver brazing.

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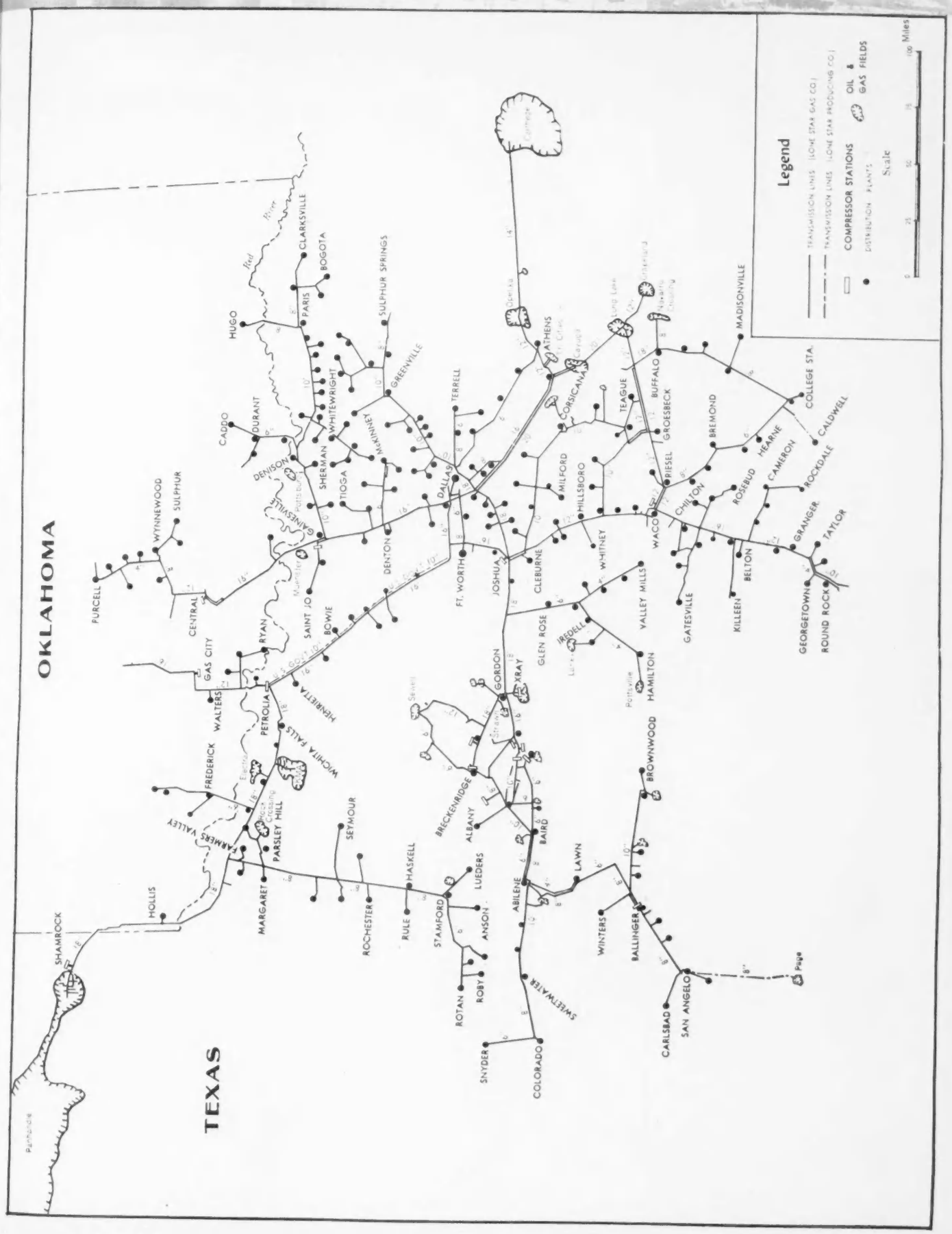
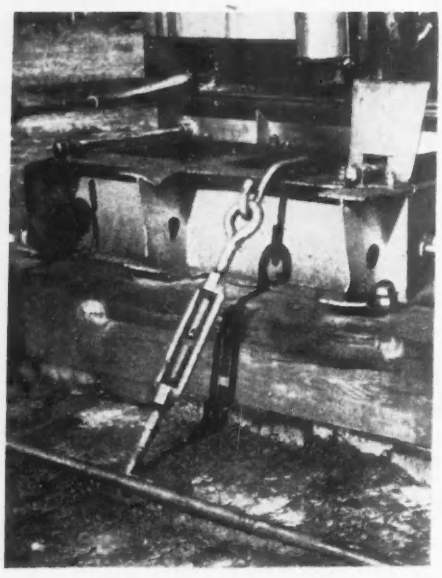


PRODUCTION HINTS

Relieve Stress in Pumping Units



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FOUNDATIONS

Overstressing the bolts used to retain a deep-well pumping unit in place was prevented by burying a deadman beyond the working platform and putting a heavy tie rod and turnbuckle into service in line with the arc or plane of travel through which the beam swung.

Instead of attaching the eye of the turnbuckle directly to the top of the 10-inch I-beam forming the end of the unit skid, a hook was formed from steel rod of the same diameter as that of the turnbuckle. The hook was made with a narrow closure at one end, to engage the flange of the I-beam, while the other was formed to engage the eye of the turnbuckle.

To provide sufficient flexibility so that the full load was not thrown instantly on the hold-down, the hook was not laid directly across the top of the beam, but was supported on a pair of short cross members, so set as to allow the horizontal section of the hook to flex within its elastic limit.

Corner bolts on the mounting skid served principally as guides to maintain unit alignment after the hook was installed, with the bolts at the engine end serving to take a part of the load after the hook began to yield.

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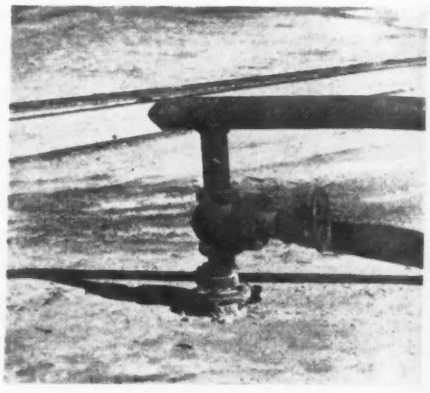
Protect Regulators

EQUIPMENT CARE

Production control equipment such as pressure regulators, temperature controllers, etc., are sometimes located where there is a possibility of objects falling on them. Such control equipment used on treaters, separators, or other lease units can be shielded by a simple device found satisfactory by one production foreman.

Illustrated is the type of hood used to protect a pressure regulator not only from falling objects, but also to a limited extent from the weather. The hood consists of a square sheet of galvanized roofing material formed in such a manner that the corners will rest on top of the regulator at the diaphragm flange. A slight spring to the cover keeps it snugly in place, yet permits removal when repairs or adjustments are necessary. In the installation shown, the hood also protects the sensitive diaphragm section from the hot sun.

Simplify Meter Run



METERING

Unless a sweep bend is used, and an additional weld thus introduced into the meter run, the angle where the riser enters or leaves the horizontal portion of the run is a point of weakness due to the concentration of stress over a portion of the weld which cannot be reinforced readily.

One producer gets away from the angle welds in the run by bringing up vertically both risers, joinning them to the run with 90-degree intersections, and thus using welds which are reinforced as much as possible by the natural curve of the pipe walls. Both ends of the run are carried far enough beyond the welds to insure full pipe wall strength, and then bull-plugged by orange-peeling the pipe itself.

Such a construction simplifies the tie-in welds, as no close measuring must be done in advance, as is the case with formed turns or beveled pipe are used.

. . . . . how much is it worth?

EVEN IN THIS ATOMIC ERA, what engineer wouldn't be awed at the possibility of building a bridge of his own design across the hazardous Niagara gorge? Yet John A. Roebling was commissioned to do just that *98 years ago* . . . ten years before this country's first oil well was drilled!

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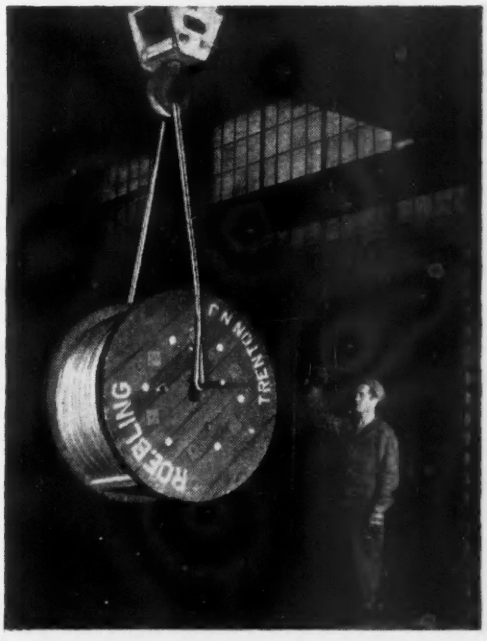

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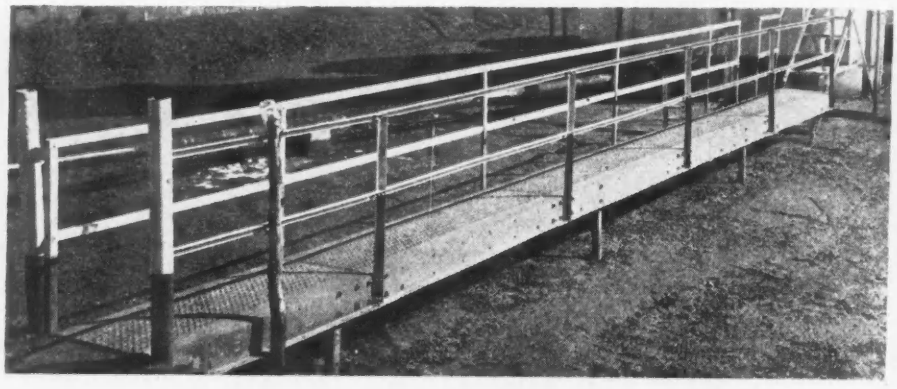


WALKWAYS

A walkway to the tank battery at or above the level of the top of the fire wall not only promotes cleanliness of the tank battery, but also removes a hazard to the switcher or gauger who must visit the tanks.

One producer uses a section of material that otherwise would be used as a platform alongside the tanks to form the connecting link between fire wall and stairway. This truss-reinforced walkway, with safety steel footing, is supported on foundation blocks set well into the earth, and attached to the stairway with railing members.

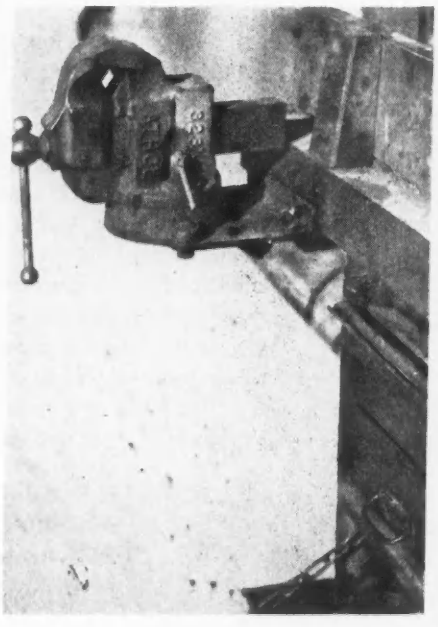
The steel always furnishes safe footing, is easily cleaned if oil is spilled on it, and is in no danger of being floated away, as is the case with planks laid along the ground to provide dry footing.

Use of the steel walkway eliminates a fire hazard which is present when a wooden walk is used, and where the timber reaches an area which is not fireproofed by thorough clearing or soaking with fire-resistant solutions.

Mount Vise on Truck

TOOL MOUNTING

One of the disadvantages of mounting a vise on the side of a truck lies in being limited as to the length or type of materials that can be handled conveniently due to interference of truck bed stakes or material being carried. And, too, it is not desirable to mount any device in such a way that it would overhang the truck bed to impair side clearance of the truck. These problems were overcome in a practical manner by the production department of one company.



Instead of mounting the vise solidly on the side of their service truck bed, it was mounted first on a piece of steel plate, the latter hinged at a point some 12 to 18 inches inboard from, and underneath the side of the bed. At the appropriate position on this plate, between the rear of the vise and the edge of the bed, was welded a transverse strip of light-weight material which provided the means of locking the vise plate in the working position. Illustrated is the vise elevated to the working position, with matching holes drilled through the strip and steel sheathing of the truck bed, to permit a steel pin to be thrust into place, securely locking the unit in place. When so locked, the vise plate is quite rigid and permits the vise to be used on any job that normally would be handled with the vise mounted conventionally on a solid bench.

When not in use, the vise is swung back beneath the bed overhang, and there locked in position.

Completions Hold Pace Despite Shortages

WELL completions in April were made at practically the same rate as in the preceding month, which was a fairly active drilling period. Although the severe shortage of tubular materials is no doubt having its effects on this year's drilling program, the industry so far this year has completed almost 7 percent more wells than in the same four months of last year.

Whether this year's lead over last can be maintained or increased is doubtful, with the pipe situation seeming to grow worse. The threat of more coal strikes, when the mines are turned back to the owners next month, doesn't offer much hope for alleviation of steel shortages this year.

In April, there were 2455 wells of all classes completed, a drop of 59 wells from March's total, but 137 more than were finaled in April of last year. Although the April total shows a slight decrease from March's when taken on a daily average basis it actually proves slightly ahead. The difference is the variation in the number of days in the periods. Of the current month's well completions, 370 were exploratory wells and the remainder routine development wells.

Completions in the first four months of this year totaled 9613, an increase of 6.7 percent over the 9006 wells of last year's comparable period. At the end of March, a month earlier, the lead over last year amounted to 7.2 percent. Although this drop in margin of increase was only slight, it was perhaps some reflection of the pinch of inadequate pipe supplies.

The majority of states showed increases of varying degrees in the number of wells drilled this year over last year. However, there were several whose records showed considerable declines. Among those showing decreases were Illinois, Louisiana, Michigan and Montana.

Some of the more active states and their rates of increase were Texas, up 9 percent; Kansas, up 34 percent; and Mississippi and New Mexico, up 39 and 47 percent, respectively.

[5]Well Completions in the United States During April, 1947, and Cumulative for Year

(Figures compiled from weekly reports of Oil Weekly staff, with following exceptions: Illinois from Illinois Geological Survey; Indiana from Indiana Division of Geology; Missouri from Missouri Geological Survey; Tennessee from Tennessee Division of Geology; Bradford, Kane-Clarendon, and Allegany fields of Pennsylvania and New York from The Producer's Monthly.)

STATE OR DISTRICT	MONTHLY COMPLETIONS, APRIL, 1947													CUMULATIVE TOTAL January-April				Rigs in Operation (Drilling, Rigging Up and Shut Down)		
	New Wells								Total Drilled Deeper	Total Completions										
	Oil	Dist.	Gas	Dry	Water Input	Gas Input	Water Disposal	Total New		April, 1947	Mar., 1947	April, 1946	Footage April, 1947	Wells 1947	Wells 1946	Percent Diff.	Footage, 1947	April 30, 1947	Mar. 31, 1947	April 30, 1946
Alabama				2				2		2	1	1	10,439	6	6		22,815	3	3	5
Arizona												1			1	—100.0		2	2	1
Arkansas	11			11				22		22	19	17	92,215	71	56	+ 26.8	304,508	33	34	21
California	122		4	21				147	4	151	178	140	642,533	633	607	+ 4.3	2,634,153	282	291	306
Colorado	6			4				10		10	17	12	54,470	47	37	+ 27.0	273,179	48	47	68
Florida				2				2		2	1	1	18,683	10	6	+ 66.7	52,990	7	7	8
Georgia											1			1	1		3,847			2
Illinois	69			51				120	2	122	184	233	315,273	586	683	— 14.2	1,489,787	185	183	255
Indiana	14		3	23				40		40	46	38	76,072	153	114	+ 34.2	279,932	82	71	76
Kansas	90		32	64			2	188	6	194	177	129	607,813	754	643	+ 17.3	2,373,027	284	298	263
Kentucky	19		18	14				51		51	60	66	94,608	221	237	— 6.8	401,382	112	105	111
Louisiana	53	5	3	33				94	1	95	95	94	531,586	393	398	— 1.3	2,419,296	161	149	177
North Louisiana	27	2	2	21				52	1	53	44	51	161,526	201	205	— 2.0	704,309	62	50	78
South Louisiana	26	3	1	12				42		42	51	43	370,060	192	193	— 0.5	1,714,987	99	99	99
Michigan	10		1	15				26		26	46	55	61,065	142	219	— 35.2	332,705	151	127	148
Mississippi	23		3	7				33		33	23	18	299,004	103	74	+ 39.2	877,582	97	92	41
Missouri	1		2	2				5		5		4	1,923	19	8	+137.5	9,847	2	3	7
Montana	12			1				13		13	6	24	27,114	31	78	— 60.3	75,942	34	39	71
Nebraska																		6	6	4
New Mexico	27		4	3				34	7	41	56	24	187,157	182	124	+ 46.8	758,318	109	107	93
New York	78		1	1	49			129		[6]129	[6]122	117	184,330	[6]488	342	[6]+ 42.7	693,264	[6]156	[6]149	142
North Carolina											1			1			6,370			
Ohio	24		43	45				112		112	95	85	314,650	407	352	+ 15.6	1,190,329	249	233	246
Oklahoma	169		11	108		3		291	17	308	315	175	894,026	1,197	818	+ 46.3	3,537,362	497	515	447
Pennsylvania	97		47	18	80	24		266	2	[6]268	[6]252	391	454,689	[6]1,052	1,364	[6]— 22.9	1,819,436	[6]360	[6]332	405
South Dakota																				7
Tennessee												1			2	—100.0		10	10	5
Texas	469	4	30	210	5	1	4	723	30	753	740	624	3,194,912	2,788	2,554	+ 92	12,141,422	1,160	1,120	1,092
Dist. 1 S. Central	15			13				28	1	29	21	13	111,740	104	45	+131.1	374,905	22	31	29
Dist. 2 Middle Gulf	33	1	1	13				48	2	50	61	[1]	308,132	203	[1]	[1]	1,238,441	52	58	[1]
Dist. 3 Upper Gulf	40	3	2	20				65		65	77	60	419,980	257	231	+ 11.3	1,651,382	92	84	76
Dist. 4 L. Gulf-S.W.	52		3	27				82	2	84	100	121	452,488	345	462	+ 18.6	1,883,780	94	112	162
Dist. 5 East Central	4		1	6				11		11	9	[2]	65,366	36	[2]	[2]	177,294	23	24	[2]
Dist. 6 Northeast	24		9	8			1	42	1	43	39	52	229,114	152	222	— 15.3	774,547	60	66	116
Dist. 7-B N. Central	34		3	31				68	1	69	56	[3]	231,174	252	[3]	[3]	790,489	121	115	[3]
Dist. 7-C W. Central	18			2				20		20	18	[4]	64,269	68	[4]	[4]	235,388	62	63	[4]
Dist. 8 West	133		2	20				155	13	168	139	127	765,902	573	534	+ 20.0	2,797,846	353	331	375
Dist. 9 North	99		2	67	5	1	3	177	10	187	168	221	446,724	649	916	— 1.6	1,711,873	167	141	276
Dist. 10 Panhandle	17		7	3				27		27	52	30	100,023	149	144	+ 3.5	505,477	114	95	58
Utah				2				2		2			11,501	2	2		11,501	5	5	8
Washington																		1	1	
West Virginia	6		43	7				56	2	58	67	62	166,356	261	233	+ 12.0	747,173	382	390	372
Wyoming	12		2	4				18		18	12	6	85,269	65	47	+ 38.3	318,028	52	60	74
Total U. S.	1,312	9	247	648	134	28	6	2,384	71	2,455	2,514	2,318	8,325,688	9,613	9,006	+ 6.7	32,774,195	4,470	4,379	4,455

[1] Dist. 2 included with Dist. 4. [2] Dist. 5 included with Dist. 6. [3] Dist. 7-B included with Dist. 9. [4] Dist. 7-C included with Dist. 8. [5] Effective with data for September, 1946, figures are on Calendar month basis. Previously, all statistics were for 4-week and 5-week months, explained when published. [6] Part of Bradford field now included in New York; formerly, all was carried in Pennsylvania.

Exploration 10.6 Percent Above 1946 Period

APRIL saw the industry continue with its plan to drill more exploratory wells in 1947 than in any other year in history. Records for the first four months of this year when compared with last year's record-breaking activity point to realization of this goal.

With the recent crude price increases and the ever present need for new reserves as motivating forces, the exploration program might well be far ahead of present levels, but many operators are finding it increasingly difficult to find adequate casing and tubing supplies to carry out their drilling programs. Many have had to resort to searching junk yards for material that could be used after reconditioning.

The tubular goods situation doesn't look too good for the remainder of the year. Pipe mills are unable to get enough steel for capacity operation and the threat of coal strikes after the mines are returned to their owners next month doesn't brighten this picture.

Exploratory drilling resulted in 370 wells being completed in April compared with 379 in the preceding month and 361 in the same month a year ago. Of these April wells, 87 were successful in finding production and amounted to 23.5 percent of the total. Oil discoveries comprised 57 of the total. These were 33 new fields and 24 new horizons in established fields. Twelve oil fields also were extended by at least ½ mile. The remainder were distillate and gas discoveries and extensions.

Summary of Results of Exploratory Drilling

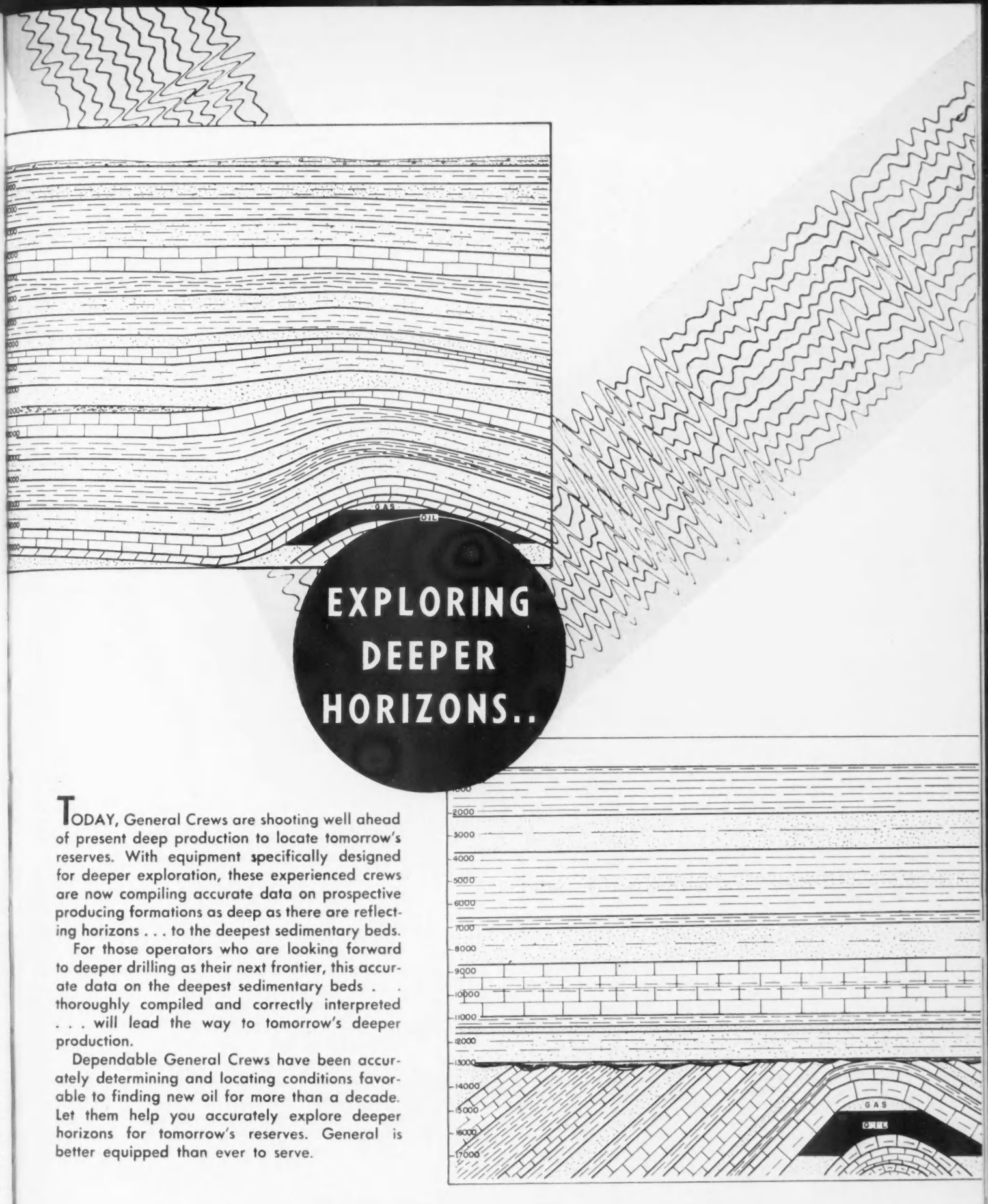
ITEM	April, 1947	Mar. 1947	Four Months Jan.-April 1947	1946	Percent Diff.
Oil Discoveries	57	56	212	158	+ 34.2
New Fields	33	28	121	90	+ 34.4
New Pays	24	28	91	68	+ 33.8
Distillate Discoveries	3	8	28	22	+ 27.3
New Fields	1	4	11	10	+ 10.0
New Pays	2	4	17	12	+ 41.7
Gas Discoveries	14	6	32	48	— 33.3
New Fields	13	3	24	35	— 31.4
New Pays	1	3	8	13	— 38.5
Total Discoveries	74	70	272	228	+ 19.3
Extensions to Fields	13	12	44	67	— 34.3
Oil Fields	12	9	36	47	— 23.4
Distillate Fields		1	4	18	— 77.8
Gas Fields	1	2	4	2	+100.0
Total Prod. Tests	87	82	316	295	+ 7.1
Dry Holes	283	297	1,204	1,079	+ 11.6
Wildcats	275	282	1,162	1,051	+ 10.6
New Pays	3	7	21	18	+ 16.7
Outposts	5	8	21	10	+110.0
Total Expl'tory Tests	370	379	1,520	1,374	+ 10.6
Percent Productive	23.5	21.6	20.8	21.5	
Percent Dry	76.5	78.4	79.2	78.5	

In the first four months of this year exploratory completions totaled 1520 against 1374 in the same period of last year, an increase of 10.6 percent. Successful wells numbered 316 and 295, respectively, in these two comparable periods. So far this year there have been 121 new oil fields discovered and 91 new

Results of Exploratory Drilling in April and First 4 Months, 1947-1946, by Districts

State or District	MONTH OF APRIL, 1947													FIRST FOUR MONTHS, 1947																	
	Productive Tests										Unproductive Tests				Productive Tests									Unproductive Tests					Total Exploratory Tests	
	New Fields			New Pays			Extensions			Total Productive					New Fields			New Pays			Extensions			Total Productive			Total Dry				
	Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.		Wildcats	New Pays	Outposts		Oil	Gas	Dis	Oil	Gas	Dis.	Oil	Gas	Dis	4 Mo. 1947	4 Mo. 1946	Wildcats	New Pays	Outposts	4 Mo. 1947	4 Mo. 1946	4 Mo. 1947	4 Mo. 1946
Alabama											2			2												4			4	5	4	5
Arizona																															1
Arkansas				1						1	4			5				1		1				2	1	14	1		15	8	17	9
California	2						1			3	14			17	3			2			3			8	13	79			79	81	87	94
Colorado											1		2	3	1									1	3	6		4	10	5	11	8
Florida											2			2												10			10	6	10	6
Georgia																										1			1	1	1	1
Illinois	1			6						7	18			25	11			17			8			36	20	95			95	135	131	155
Indiana	1									1	12			13	1			4			1			6	4	23			23	15	29	19
Kansas	5	3					1			9	29			38	18	6					1	1		26	33	97			97	76	123	109
Kentucky				1						1	3			4	1			1			1			3	7	19			19	29	22	36
Louisiana		1		1		1				3	13	1		17	5	1	1	8		8	1		1	25	35	63	2		65	61	90	96
N. Louisiana				1						1	8	1		10	1			1					1	3	9	37	2		39	34	42	43
S. Louisiana		1				1				2	5			7	4	1	1	7		8	1			22	26	26			26	27	48	53
Michigan	1									1	10			11	2						1			3	10	57	1	1	59	67	62	77
Mississippi											2			2		1		1			2			4	3	17			17	19	21	22
Missouri																										7			7	3	7	3
Montana																									1	3	1		4	3	4	4
New Mexico	1							1		2	2			4	3						1	1		5	2	15	2		17	20	22	22
New York																														1	1
North Carolina																										1			1	1		
Ohio											4			4											16	18			18	12	18	28
Oklahoma	8	3								11	43			54	29	6	1	1			1			38	37	202			202	90	240	127
Pennsylvania																									2						2
Tennessee																															2
Texas	14	4	1	15	1	1	9			45	113	2	1	161	45	8	9	55	8	8	15	2	3	153	99	421	12	12	445	429	598	529
Dist. 1 S. Central											11			11	3									3	5	41			41	28	44	33
Dist. 2 Middle Gulf	2		1	1						4	9			13	5			4	4	1	2	1		17	1	40		2	42	1	59	1
Dist. 3 Upper Gulf	3			1	1	1	3			9	13			22	6	2	3	3	3	3	4		3	27	26	43		1	44	44	71	70
Dist. 4 L. Gulf-S.W.	2	2		6						10	19		1	30	6	3	2	16	4	3		1		35	16	71		4	75	83	110	99
Dist. 5 E. Central				1			2			3	5			8				1			2			3	[2]	18	1	1	20	[2]	23	[2]
Dist. 6 Northeast	1	1								2	6	1		9	1	1								2	13	19	2		21	36	23	49
Dist. 7-B N Central	1			3						4	18			22	8			14						22	[3]	69	3		73	[3]	94	[3]
Dist. 7-C W. Cent.	3						1			4	1	1		6	4						2			6	[4]	6	1	1	8	[4]	14	[4]
Dist. 8 West	1			2			1			4	9			13	2			8			3			13	14	34	3	3	40	55	53	69
Dist. 9 North	1	1		1			2			5	21			26	9	2		9			3			23	25	77	2		79	174	192	199
Dist. 10 Panhandle											1			1	1								1	2		3			3	9	5	9
Utah											2			2											1	2			2	1	2	2
West Virginia		1								1				1		1								1	2				4	1	6
Wyoming		1					1			2	1		2	5	2	1		1			1			5	6	8	2	4	14	5	19	11
Total U. S.	33	13	1	24	1	2	12	1		87	275	3	5	370	121	24	11	91	8	17	36	4	4	316	295	1162	21	21	1204	1079	1520	1374

[1] Dist. 2 included with Dist. 4. [2] Dist. 5 included with Dist. 6. [3] Dist. 7-B included with Dist. 9. [4] Dist. 7-C included with Dist. 8.



EXPLORING DEEPER HORIZONS..

TODAY, General Crews are shooting well ahead of present deep production to locate tomorrow's reserves. With equipment specifically designed for deeper exploration, these experienced crews are now compiling accurate data on prospective producing formations as deep as there are reflecting horizons . . . to the deepest sedimentary beds.

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GEOPHYSICAL COMPANY HOUSTON

"We Like It," You Say

Readers of The OIL WEEKLY have overwhelmingly acclaimed the monthly wildcat feature. Recently, the readers were asked their opinion of this feature and 91.8 percent of those who participated in the poll asked that it be continued. In adherence to the wishes of the readers the feature will continue to appear monthly.

oil pay horizons located for an overall total of 212 oil discoveries against 158 last year.

The only discovery in Arkansas for the month was the finding of a new oil pay in the Spirit Lake field, Lafayette County. The discovery came in flowing 336 barrels of 33-gravity oil through a 7/32-inch choke from the Glen Rose sand.

What may prove to be the most important California discovery in several years was made by Standard Oil Company of California in Ventura County. Initial production of the discovery well was 140 barrels of 46.6-gravity oil through a 10/64-inch choke. Another new oil field for the state was found by Seaboard Oil Company in the Bacon Hills area of Kern County. The well originally flowed 500 barrels of 37.9-gravity oil through ¼-inch choke, but began making water from a sand above the pay. Water was cemented off and the well flowed by heads at a 110-barrel rate, but it probably will be put on the pump. Outcome of an offset, to be spudded soon, will be a good indication of the discovery's importance.

Five oil fields were discovered in Kansas during April. The find that appears to be the most important of the group is the Rooks County discovery made by Cities Service Oil Company. The well pumps 360 barrels per day from the Arbuckle lime and made a depthograph potential of 1283 barrels daily.

Oklahoma had a very successful month with five out of eight new oil fields showing real promise. Two of these five now appear to be of major importance. Oil Carriers, Inc.'s, new field in McClain County appears to be a major discovery in the McClain-Garvin County trend. The discovery well, Wynne 1, flowed 1057 barrels of 44-gravity oil through ¾-inch choke from the Chimney Hill (Hunton) lime. The other new field of significance is the Elmore, Northeast, Garvin County, discovered by Anderson-Pritchard Oil Corporation et al. The discovery of this major shoreline trend field was made by the company's Seaton 1.

Texas netted 14 new oil fields and four new oil pay horizons from its April exploratory efforts.

New Oil, Distillate and Gas Fields and New Pay Horizons Discovered in the United States in April, 1947

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of this Tentative Opinion).
		ARKANSAS—New Oil Pay									
Lafayette	Spirit Lake	Stewart, Lewis & Crow Prod. Co's H. Moore Est. A-2, c se nw 13-16s-25w	4- 8-47	4-27-47	4245	3730- 3760	Glen Rose sd; L Cre	F 336; 7/32"	33	.....	.....
		CALIFORNIA—New Oil Fields									
Kern		Seaboard Oil Co's Seaboard-Bandini 3-21, 21-28s-20e, Bacon Hills area	.....	4- -47	8477	7846- 7876	Oceanic sd; Mio	F 500; ¼"	37.9	.....	Operator having trouble with wtr. Offset well to determine import of discovery.
Ventura		Standard of Calif's McGrath 2, 26-2n-23w, Oxnard Plain 7 mi s Ventura Ave. fld.	.....	4- -47	8660	8428- 8473 8632- 8660	Repetto sd; L Plio	F 140; 1.3 mln	46.6	Seis-cd	May prove to be most import disc in State in several years.
		CALIFORNIA—Oil Field Extension									
Fresno	Coalinga, NE	Sharples Corp's Hyde 1, 6-19s-16e, ¾ mi n ext	.....	4- -47	8900	8240- 8320	Avenal sd; Eoc	7/32" F 200	24	.....	.....
		ILLINOIS—New Oil Field									
Effingham	Elliottstown	Gulf Ref. Co's (Schock) J. M. Schultz 1, sw sw nw, 32-7n-7e, 3 mi nw Bible Grove, N. pl.	3-19-47	4-22-47	2884	2730- 2738	Rosiclare li; Miss	P 62; 20 wtr	....	.....	.....
		ILLINOIS—New Oil Pays									
Clay	Kenner, W	Phillips Pet. Co's Randall 1, sw sw ne 23-3n-5e	1-30-47	4-15-47	3006	2705- 2717	Bethel sd; Miss	P 241; 50 wtr	....	.....	2nd well in pl. Disc well produces fr Cypress.
Clay	Kenner, N	Nat'l Assoc. Pet. Co's Theobald 4-A, nw nw sw 17-3n-6e	3-13-47	4-15-47	3041	2964- 2968	McClosky li; Miss	P 308	....	.....	Previous prod. from Bethel sand.
Gallatin	Inman, N	Coy & Ashalnd's Foster 2, sw se nw, 11-8s-9e	2-13-47	4- 7-47	2524	2509- 2523	Cypress sd; Miss	P 50	....	.....	Other pays are Hardinsburg, Aux Vases & McClosky.
Crawford	Main	W. H. Wright's Walters 1, ne sw se, 19-7n-12w	9-18-46	4- 7-47	1823	1819- 1823	Salem li; Miss	P 20; 3 wtr	....	.....	Pl also produces fr Penn and Devo. May result in deepenings.
White	Concord, N	C. E. Brehm's A. Williams 1, (OWWO) ne ne sw, 10-6s-10e	.....	4-22-47	3071	3033- 3039	Lwr O'Hara li; Miss	P 80	....	.....	Pumped 40 fr Aux Vases before workover.
Edwards	Bone Gap	Cities Service's L. Thread "A" 1 nw nw nw, 18-1s-11e	.....	4-29-47	3316	3228- 3235	Rosiclare li; Miss	P 99	....	.....	Originally comp in McClosky. May result in more McClosky well plugbacks.
		INDIANA—New Oil Field									
Posey	College, N	Calvert & Willis Hasting's 1, sw sw nw 10-8s-14w	.....	4- -47	2721	2675- 2690	McClosky li; Miss	P 104; 40 wtr	....	.....	.....
		KANSAS—New Oil Fields									
Rice		Tom Allan et al's Chronister 1, se se se 35-20s-7w, 2 mi n Wherry pl	.....	4-30-47	3427	3423- 3426	Cgl.; Penn	P 67	....	Ant; seis-dr	No importance.
Barton		Cities Service's Bondurand 1, ne ne sw, 22-20s-15w, 1 mi s Bergtal pl	.....	4-16-47	3730	3720- 3730	Arbuckle li; Ord	F 49; 24 wtr	....	Ant; seis-dr	No importance.
Rocks		Cities Service's Baumgardner 1-B, ne ne sw 21-9s-18w, 3 mi se Barry, SE pl	.....	4- 8-47	3586	3571- 3586	Arbuckle li; Ord	P 360	....	Ant; dr	Made depthograph potential of 1283 bbls. daily.
Rush	Weitzell-Gorham	Darby & Bothwell's Weitzell 1 sw sw nw 1-16s-20w, 3½ mi s Penny-Wann pl.	.....	4-21-47	3769	3678- 3690	Gorham sd; Cam	P 194	....	Ant; dr	.....
Rush		Solar Oil Co's Tammen 1, sw sw sw 24-19s-16w, 2 mi ne Ryan pl	.....	4-20-47	3698	3654- 3698	Arbuckle li; Ord	Sw&F 120	....	Ant; dr	No major importance.
		KANSAS—Oil Field Extension									
Pawnee	Ash Creek	Bay Pet. Co's Wise 1, ne ne ne 1-21s-16w, ½ mi s ext	.....	4-19-47	3816	3751- 3816	Arbuckle li; Ord	F 25; 2 mln	....	Ant; dr	.....
		KANSAS—New Gas Fields									
Rice		Drillers Gas Co's Gray 1, cse nw 1-20s-9w, 2 mi e Chase Oil pl	.....	4-23-47	3001	2030- 2050	Americus sd; Penn	.3 mln	....	Ant; dr	Opens gas prod 4½ mi w Lyons gas pool.
Pawnee		J. M. Huber Corp. et al's Torrance 1, sw sw sw 19-21s-15w, 5 mi ne Larned townsite.	.....	4-30-47	3857	3843- 3857	Arbuckle li; Ord	35 mln	....	Ant; dr	County's 2nd gas pl; other is Zook pl, 12 mls.
Stafford		J. M. Huber Corp's O'Conner 1, cen nw nw 16-24s-15w, 1½ mi sw Macksville pl.	.....	4-30-47	4073	4061- 4073	Arbuckle li; Ord	26 mln	....	Ant; dr	Opens gas prod betw Macksville and Farmington pools.
		KENTUCKY—New Oil Pay									
Henderson	Tunnell Hill	Carter Oil Co's Melton 1, 4-N-23	.....	4- -47	1782	1765- 1782	Waltersburg sd; Miss	P 109	....	..	Pool's previous prod fr Cypress sd.
		NORTH LOUISIANA—New Oil Pay									
Webster	Cotton Valley	Hyman Muslow et al's Warren Cox 1, 660 fr sl 2173 fr wl 15-21n-10w	2-27-47	4-27-47	6058	5616- 5644	Pettit sd; L Cre	F 42; ½"	45	.....	.....

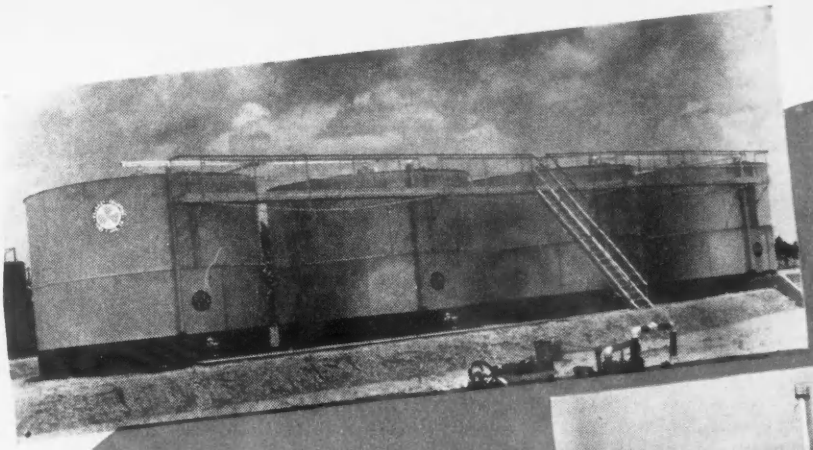
		SOUTH LOUISIANA—New Gas Field										
Iberia	Tigre Lagoon	Union of Calif's P. O. Landry 1, 1980 w 1980 n of Sect 29-13s-5e, 3¼ mi w Avery Island prod.	1-26-47	4-22-47	11843	11480–11500	Sd; Mio	1.5 mln; 1/8"			Little importance.
		SOUTH LOUISIANA—New Distillate Pay									
St. Mary	Bayou Sale	Texas Co's State-St. Mary Ld Co, unit 2-4, 1900 w of nec Sect 11 in unit 2, 11-17s-9e.	2-10-47	4-18-47	10285	9900–10010	Sd; Mio	No gge; 1.6 mln; ½"	50.5	D	Unimportant.
		MICHIGAN—New Oil Field									
Newaygo	Barton	Mich. Devonian Pet. Co's Corey 1, ne sw ne 16-16n-11w, 10 mi sw Reed City fld.	12-5-46	4-17-47	3098	3090–3098	Traverse li; Devo	P 80; 5 wtr	....	Ant; geol	Small pool probable.
		NEW MEXICO—New Oil Field									
Lea		Texas Co's W. C. Garrett 1 c ne se 22-16s-38e, 9 mi e by n Lovington fld.	12-12-46	4-9-47	5760	5300–5690	San Andres li; Perm	P 15; 15 wtr	27	Ant; geol	Involves large struct with prospects for more attractive prod fr San Andres and Clear Fork.
		NEW MEXICO—Gas Field Extension									
San Juan	Barker Creek	Southern Union's Barker 18, sw sw sw 11-32n-14w, 2 mi n ext.		4-12-47	9247	8925–9005	Pennsylvanian	74.8 mln	....		
		OKLAHOMA—New Oil Fields									
Noble		Kingwood Oil Co's Bolay 1, sw sw nw 35-23n-1w, 2 mi sw Ceres, SE pl.		4-30-47	4486	4468–4486	Bartlesville sd; Penn	F 720; ¼"	....	Ant; dr	
Lincoln		Texola Drlg Co's Sommers 1, ne ne ne 5-14n-5e, betw Davenport and Davenport, W. pls.		4-30-47	3589	3551–3589	Prue sd; Penn	F 38	46.6	Ant; dr	
Kingfisher		J. A. King's Lankard 1, ne ne se 34-17n-6w, 6 mi ne Kingfisher townsite.		4-—47	7582	7562–7582	Hunton li; Devo-Sil	P 4	39	Ant; dr	No importance.
Garvin	Elmore, NE	Anderson-Prichard Oil Corp et al's Seaton 1, se se nw 14-2n-2w, 6 mi se Antioch, SW, pl.		4-1-47	6507	6410–6454	Pennsylvania sd; Penn	F 912	42	Str trp; dr-seis	Opens major pool on shoreline trend.
Carter		H. F. Gibson's Lawton-Smith 1, nw nw sw 14-5s-1w, 4 mi se Lone Grove, SW pl.		4-1-47	4566	4152–4200	Pennsylvania sd; Penn	F 105	37.2	Str trp; dr-seis	Opens good prod betw Brock and Lone Grove SW. pools.
Jefferson		T. F. Hunter's Pfile 1, ne of 24-7s-6w, near Seay gas pl.		4-9-47	2157	1347–1367	Pennsylvania li; Penn	P 4; 12 wtr	31	Str trp; dr	No importance.
McClain		Oil Carriers, Inc's Wynne 1, ne ne se 27-5n-4w, 2 mi s Lindsay, N. pl.		4-1-47	10212	10116–10160	Chimney Hill (Hunton) li; Devo-Sil	F 1057; ¾"	44	Possible trp; dr-seis	Major disc in McClain-Garvin Co. trend; on shoreline trend fr nw to se.
Seminole	Lima, SE	Davon Oil Co's Miller 1, ne ne sw 16-8n-7e, 1 mi sw Sancho dist.		4-2-47	3262	3260–3262	Cromwell sd; Penn	F 132; 2.6 mln; ½"	....	Str trp; dr	Opens new prod in old area prev drld to Wilcox sd.
		OKLAHOMA—New Gas Fields									
Beaver	Light	H. L. Hunt's Light Est. 1, cse se 9-6n-21ecm, 18 mi nw Beaver townsite.		4-5-47	6325	6226–6255	Mississippi li; Miss	3.5 mln	....	Ant; dr	No great importance.
Logan		Jordan Pet. Co's Porter 1, ne se 30-16n-1e, betw Evansville, NW and Meridian pl		4-26-47	4881	4871–4881	Bartlesville sd; Penn	F 50 dist; 50.4 mln	....	Str trp; dr	May prove to be State's biggest gasser of year.
Comanche		Texola Drlg Co's Tas-Saw 1, sw ne sw 24-4n-11w, 2 mi n Ft. Sill Military Res.		4-24-47	1761	1759–1761	Pennsylvania sd; Penn	10.7 mln	....	Str trp; dr	Proves prod 4 mi nw Ft. Sill Gas pool.
		TEXAS DISTRICT 2 (MIDDLE GULF COAST)—New Oil Fields									
Bee	Yoward	Gasoline Prod. Corp's Harold E. Yoward 1, 660 fr nw&swl 160-ac lse, Chas. B. Shain sur, 1½ mi w Mineral fld.	2-5-47	4-14-47	8500	7470–7493	Slick (Wilcox) sd; Eoc	F 165; 3/4"	41.2		Additional development expected.
Bee	Dirks-Wilcox	Dirks Bros.-Tide Water's Page Est. 1-B, 660 fr ne & nwl 213-ac lse, and J. W. McFarland sur, nw flk Dirks fld.	2-24-47	4-15-47	7438	7429–7435	Mackhank (Wilcox) sd; Eoc	F 139; 3/4"	36.8		Additional development expected.
		TEXAS DISTRICT 2 (MIDDLE GULF COAST)—New Distillate Field									
Karnes		W. E. Kinnear's E. Dittmer 1, (OWDD) 1350 sw alg sel of Thos. W. Uzzell sur, fr e cor th 467 se at rs to lcn.	2-19-47	4-22-47	8180	6765–6769	Luling (Wilcox) sd; Eoc	F 48; 1 mln; 3/32"	59		Unimportant.
		TEXAS DISTRICT 2 (MIDDLE GULF COAST)—New Oil Pay									
Victoria	Bloomington	Amerada's Alexander unit 1, 6200 fr nel 3700 fr sel F. Perez sur, 1 mi nw Heyser fld.	2-22-47	4-26-47	6921	4904–4909	Frio sd; Olig	F 155; 3/32"	23.3		Additional development expected.
		TEXAS DISTRICT 3 (UPPER GULF COAST)—New Oil Fields									
San Jacinto		Mac Drlg Co's Cynthia Payne 1, 560 fr nl 400 fr el 80.5-ac lse; fr nly/e cor Vital Flores sur, go nw 10,200 alg nel, th 5550 sw at ra.	1-31-47	4-29-47	8260	7682–7702	Wilcox sd; Eoc	F 76; 30% wtr ¼"	36.8		Little additional development expected.
Brazoria	Manvel, SE	Progress Pet. Co's O. L. Rash et al 1, Thos. Spraggins sur, lot 23, off se flk in fited area.	3-17-47	4-25-47	5645	4590–4606	Sd; Olig	F 133; 1/8"	25.4	Flt; sub	Important new disc on flk of Manvel dome.
Newton		Sun's E. S. White-Sue Ella Mae Smyth West 1, 6899 fr nl 3950 fr wl 9446 fr el 4428-ac lse and Robt. Goodwin lge.	12-29-46	4-12-47	11002	10642–10656		F 36; 37% wtr 1/8"	48.7		Little additional development expected.
		TEXAS DISTRICT 3 (UPPER GULF COAST)—New Oil Pay									
Liberty	Hankamer	Gulf's E. W. Boyt 29, 2045.4 fr wl 3326.7 fr el, Amos Allen sur, 618.2-ac lse.	3-6-47	4-18-47	7347	7110–7122		F 164; 1/8"	35.3		
		TEXAS DISTRICT 3 (UPPER GULF COAST)—Oil Field Extensions									
Hardin	Olive	Pan American Prod Co's Olive Sternenberg Lbr. Co., 1-B, 5109 fr sl 825 fr el G. Dorsey sur, 2000.8-ac tr.	5-19-46	4-7-47	12946			F 11; plus 75% wtr; ½"	39	Flt	Unimportant.
Hardin	Sour Lake, W Flk	Texas Co's Fee 330, 4034.5 fr wly wl 1155.7 fr sl 815.35-ac lse, Stephen Jackson lge, 3000 e of nearest deep w flk prod.	3-20-47	4-13-47	2696	2508–2516	Sd; Olig	P 40	18	SD	Important disc for this old fld.
Wharton	Boling	Cecil Hagen's A. C. Mick 1, 200 fr sel 125 fr swl, 112.17-ac lse S. F. Austin sur, 6000 s prod.	3-4-47	4-3-47	5114	4908–5066	Frio sd; Olig	F 164; 3/32"	29.6	SD; sub	Important ext; additional development expected.
		TEXAS DISTRICT 3 (UPPER GULF COAST)—New Distillate Pay									
Brazoria	Scoby Lake	McCarthy O & G Corp's T. A. Munson et al 1, 660 fr el 768.52 fr nl 364-ac lse, C. Smith lge, 1½ mi s Blue Lake prod.	12-28-46	4-27-47	11877	10488–10504	Frio sd; Olig	F 44; 4.6 mln; 3/32"	50.2		Little importance.
		TEXAS DISTRICT 3 (UPPER GULF COAST)—New Gas Pay									
Orange	Vidor, N	Gulf's Miller-Vidor Ld Co et al 1, 875.8 fr wl 2662.78 fr nl, J. M. Swisher sur 1	3-4-47	4-11-47	8010	6932–6934	Frio sd; Olig	No gge		Geop	Unimportant.
		TEXAS DISTRICT 4 (LOWER GULF-SOUTHWEST)—New Oil Fields									
Nueces	Sommer	Mid-Continent's John Sommer 1, 660 fr n&el w½ sect 24, Benton Pstr Sbdn and 280-ac lse.	3-7-47	4-20-47	7008	5982–5988	Frio sd; Olig	P 122; 3/16"	36		Important new disc. Additional development expected.
Webb		Dulaney Oil Co's puig et al 22, 200 fr n&el blk 55, Albercas gr, Aviator area.	3-7-47	3-18-47	1823	1790–1800	Jackson (?) sd; Eoc	P 57	21		Some additional development expected.
		TEXAS DISTRICT 4 (LOWER GULF-SOUTHWEST)—New Oil Pays									
Kleberg	Borregas	Humble's King-Rch-Borregas 10, 10,150 n of sl Sta. Gertrudis gr.	2-15-47	4-15-47	8503	6526–6536	Frio sd; Olig	F 86; 1/8"	41.3		Important new reservoir.
Jim Wells	Haldeman, S	Magnolia's Seeligson unit 4-7, 330 fr s&el lot 75, sect 62, R. P. Haldeman Sbdn, Seeligson Rch.	3-19-47	4-24-47	6001	5563–5572	Zone 22 (Frio) sd; Olig	F 54; 1/8"	40		
Jim Wells	La Gloria	Republic Nat. Gas Co's Chas. L. Scott, Tr. 2-A, 330 fr sl 500 fr wl 40-ac "A" lse, lot 9, blk 4, La Gloria townsite lds.	3-21-47	4-14-47	6690	6598–6604	Frio sd; Olig	F 109	39.5	Ant	
Starr	Davenport	Dee Davenport's Davenport-State 2, 570 fr nl 1400 fr wl sur 974.	3-16-47	4-12-47	4192	4172–4192	Frio sd; Olig	F 146; 3/4"	48.9		Additional development expected.
Starr	Kelsey-Deep (South)	Phillips' Eloy 1, 330 fr n&el n 137.8-ac Tr of 371.52-ac lse, 4400 fr wl 2400 fr nl Sta. Crus gr.	2-1-47	3-28-47	6100	5978–6000	Frio sd; Olig	F 160; 3/32"	45	Ant	
San Patricio	Sinton, W	Jones & Morgan's A. Loy Sims 3, 350 fr sel 350 fr swly/l 77.23-ac lse, M. J. de la Garza gr.	3-8-47	4-7-47	5186	5130–5142	Frio sd; Olig	F 181; 74% wtr; ¼"	36.4	Ant	Important new sand.
		TEXAS DISTRICT 4 (LOWER GULF-SOUTHWEST)—New Gas Fields									
Duval		Magnolia's Duval Co. Rch. Co.-State 1 (76), 330 fr wl 1650 fr nl CCSD& RGNG sur 76, 400-ac Tr, 2 mi s Casa Blanca fld, 4 mi w Govt. wells fld.	3-20-47	4-4-47	2341	1318–1335	Cole sd; Eoc	4.5 mln; open			Unimportant.
Webb		Hickok & Reynolds Amado Perez et al 1, 330 fr n&el 215-ac lse, 330 fr el 1277 fr nl J. Poitevent sur, 459 n ne Volpe fld.	3-26-47	4-22-47	2631	1265–1276		1.6 mln; 3/4"			Unimportant.

New Oil, Distillate and Gas Fields and New Pay Horizons Discovered in the United States in April, 1947

Also Important Extensions to Established Fields

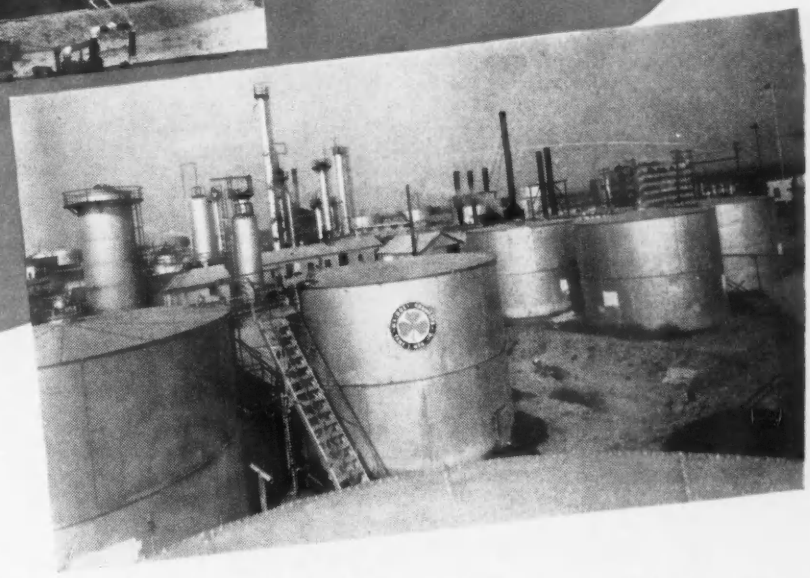
Freestone	Fairfield	**TEXAS DISTRICT 5 (EAST CENTRAL)—New Oil Pay** Barney Carter et al's W. L. Moody 1, 660 fr wel 990 fr nsl 477-ac lse, or 2300 fr ewl and 990 fr nsl H. S. Sheppard sur A-34, 15½ mi e nearest oil.	3- 2-47	4-19-47	4326	4200- 4210	Woodbine sd; U Cre	F 37; 28/64 wtr 3/8"	41	D; geol	1st oil in 3-pay gas dist fld; small prod area.
Leon	Flynn	**TEXAS DISTRICT 5 (EAST CENTRAL)—Oil Field Extensions** United North & South Development Co's R. L. Oden 1, 330 out sec of 160-ac lse, or 330 fr se and 1450 fr sw lines of W. Martin sur 7, 1⅛ mi nw ext.	9-13-46	4-19-47	8111	7055- 7235	Woodbine sd; U Cre	P 10	35	D; geol	Woodbine in area is predominately shale, accounting for sml wells fr thick sect of broken pay
Henderson	Opelika	Gulf's Laco Oil Co 1, 1500 fr wel and 660 fr nsl of 401-ac Tr, John M. Flowers sur, 8700 sw of nearest oil.	12- 7-46	4-11-47	9712	8756- 8805	Rodessa li; L Cre	F 49; 14/64"	44.3	D; geol	Import addition to band of oil prod of undetermined width heretofore confined to n and nw flk of major gas-dist multipay fld.
Harrison		**TEXAS DISTRICT 6 (NORTHEAST)—New Oil Field** Arkansas Fuel et al's M. C. McCauley Sr 1, 1250 nw of sel 800 ne of swl P. Dougherty sur, 3 mi e Scottsville.	2-11-47	4-19-47	6785	6446- 6452	Travis Peak sd; L Cre	F 55; 4/32"			
Cherokee	Jacksonville	**TEXAS DISTRICT 6 (NORTHEAST)—New Gas Field** Standard of Texas' New Birmingham Dev. Co 1, lse 2, 467 fr snl and 567 fr ewl of 319-ac Tr and G. E. Looney sur, A-509, 10 mi se Boggy Creek fld.	9- 6-46	4-28-47	10017	8698- 8652	Rodessa li; L Cre	6.6 mln; 4/16"	52.5	D; geop-geol	Subnormal dist yld accompanied by wtr; 2 thin zns are discounting factors in importance. No follow up development scheduled.
Coleman		**TEXAS DISTRICT 7-B (NORTH CENTRAL)—New Oil Field** Peg-Og Syndicate's C. E. Kennedy 1, 1150 fr nsl and 660 fr ewl of F. Owen sur 310; 3⅛ mi n prod.	10-12-46	4-28-47	2527	2400- 2407 2483- 2485 2515- 2520	Canyon li; Penn	P 20	42.8	Ant; geol	No failures in immediate area; ext of prod speculative.
Callahan	Baum-Ellenburger	**TEXAS DISTRICT 7-B (NORTH CENTRAL)—New Oil Pays** E. E. Fogelson and M. S. Ingleright's Baum-Swafford 1, 2600 fr nsl 3150 fr wel of G. M. Vidal sur, 798, A-523, offsetting shallow pumpers.	11-11-46	4-15-47	3862	3838- 3862	Ellenburger dolo; Ord	P 78	42	Ant; geol	Prolific gas fl at start of comp test exhausted. Extent of prod area speculative.
Haskell	Humphrey-Chapman	Thos. D. Humphrey's E. O. Chapman 3, 467 fr wel 1490 fr snl H. Tidwell sur 60, 1023 s of Strawn li disc.	2-13-47	3-24-47	4268	4230- 4268	Strawn sd; Penn	P 155	40	Ant; geol	Altho zne is subj to erratic performance, may surpass overlying Strawn li pay in recoverable oil.
Jones	Noodle Central	R. H. Roark-L. F. Hooker et al's J. W. Winter-Humble 5, 1300 fr snl 2500 fr wel of s½ T&P Ry 40, blk 18.	9-30-46	3-11-47	5405	3716- 3725	Reef li; Penn	P 12; 4 wtr	43.1	Reef; geol	Not important.
Crockett		**TEXAS DISTRICT 7-C (WEST CENTRAL) New Oil Fields** Moore Exploration Co's Mrs. M. S. Neal-Std. of Texas 1, 2198 fr nsl 467 fr wel sect 2, D. L. Carver sur.	5-17-46	3-18-47	2392	2284- 2392	San Andres li; Perm	P 9	36	Ant; geol	Not commercial, but perpetuates lse for deep rights reserved by Std. of Tex.
Crockett	Lancaster Hill	Gulf's University 1-R, 92 fr snl 2753 fr ewl sect 14, blk 29, 5 mi se Clara Couch fld.	1-23-47	4-10-47	1685	1677- 1685	Grayburg li; Perm	P 108	33.3	Ant; ed	Drld as core test. Made prolific fl prior to mudding to set pipe; substantial shallow crude reserve.
Reagan		Moore Exploration Co's W. E. Friend-Std. of Tex 1, 467 out of swc nw¼ sect 1, Georgetown Ry Co sur.	9-30-46	1-14-47	2582	2390- 2538	San Andres li; Perm	P 10	26	Ant; geol	Not profitable, but perpetuates lse for deep rights reserved by Std. of Texas.
Upton	Crane-Cowden	**TEXAS DISTRICT 7-C (WEST CENTRAL)—Oil Field Extension** Marshall & Smith's E. M. Cole 1, sw se ne sect 94, blk Y, F. Rooney sur, 1 mi e ext.	1-23-47	4- 5-47	2835	2816- 2835	Whitehorse li; Perm	P 55	32	Ant; geo	Intermediate acreage likely to yld pumpers of equal output.
Pecos		**TEXAS DISTRICT 8 (WEST)—New Oil Field** Pure's J. S. Oates 1-B, 1841 fr nsl 963 fr wel T&P Ry, 204, blk 3, 11¼ mi se of prod.	11- 1-46	4-10-47	845	840- 845	Rustler li; Perm	P 39; 501 wtr	18.2	Ant; geol	Drld as wtr well for nearby prospect; oil fr crevice or pocket as zn not normally source of commercial prod.
Ector	Goldsmith-Devonian	**TEXAS DISTRICT 8 (WEST)—New Oil Pays** Gulf's Goldsmith 421-E, 1992 fr nsl 666 fr wel T&P Ry 15, blk 44, T-1-S, offsetting wells on apex of the San Andres struct.	10-22-46	4-28-47	9811	7980- 7990	Devonian cherty-li; Devo	F 128; 163 wtr ½"	38.5	Ant; geol-geop	Sml initial and predominance of wtr due to incomplete shutoff in plug back; logged 80 ft. Devo abv wtr table. Devon and possibly dpr pays will attain import elsewhere on large structure.
Andrews	Fullerton-Wolfcamp	Fullerton Oil Co's H. M. Wilson 124, 1980 fr ewl 810 fr nsl PSL 15, blk A-32 w offset to fld's discovery.	11-24-46	4-28-47	9235	8098- 8135	Wolfcamp li; Perm	P 156; 68 wtr	42.1	Ant; geo	Involves compromise completion as too low to prod fr Devo and dpr zns. Wolfcamp generally has subnormal yld per acre.
Andrews	Shafter Lake	**TEXAS DIST 8 (WEST)—Oil Field Extension** Fred Turner Jr. et al's M. M. Fisher-Shell 1, c nw nw PSL 16, blk A-36, 1 mi n extension.	10-17-46	4- 6-47	4505	4340- 4456	San Andres li; Perm	P 135	35	Ant; geo	Comparatively low crude yld per ac area, but profitable at crude prices.
Wichita		**TEXAS DISTRICT 9 (NORTH)—New Oil Field** Consolidated Oil Co. et al's Alice Daves 1, 330 out swc Labor 14, Lge 2, Denton CSL sur, 12⅝ mi se Madden fld.	2-17-47	4-30-47	5525	5324- 5348	Basal Bend li; Penn	P 70	42	Ant; geol	Zn generally erratic in performance and low crude yield per acre.
Young	Holbert-Strawn	**TEXAS DISTRICT 9 (NORTH)—New Oil Pay** Warren Oil Corp's W. C. Dent 1, 467 out of swc sect 720, TE&L Co. sur, ½ mi ne Bend li discovery.	3-27-47	4-15-47	2968	2963- 2968	Strawn sd; Penn	F 60; 3/8"	40	Ant; geol	Lenticular pay; apparently not prod in fld proper.
Archer	Burns-Benson	**TEXAS DISTRICT 9 (NORTH)—Oil Field Extensions** L. T. Burns et al's Benson 2-E, 1400 out nwc sect 1398, TE&L Co sur, 1 mi sw extension.	1-27-47	4- 9-47	5231	4454- 4690	Bend li; Penn	P 100	43	Ant; geol	Intermediate acreage will be developed.
Archer	Burns-Benson	L. T. Burns et al's R. Campbell 1-B, 1500 fr nsl 467 fr wel of 553½ ac lse, or 4800 fr nsl 3350 fr wel of R.R. Rainey sur, A-354; 1 mi w extension.	12-31-46	4-11-47	4799	4620- 4688	Bend li; Penn	P 10	43	Ant; geol	Structrually low; not commercial.
Young		**TEXAS DISTRICT 9 (NORTH)—New Gas Field** Anzac Oil Corp et al's M. K. Graham 2-D, 3750 fr m/n/s 6550 fr m/w/w lines of Fractional sect C-2410.	2-12-47	2-24-47	570	560- 570	Cisco sd; Penn	3 mln		Ant; geol	Involves stray sd; small prod area.
Nicholas		**WEST VIRGINIA—New Gas Field** Columbian Carbon Co's Rowena Gross 1, Summervile district		4- -47	2015	1745- 2013	Big Lime li; Miss	1.2 mln			
Fremont	Steamboat Butte	**WYOMING—Oil Field Extension** Brinkerhoff Drilling-Sohio's Tribal 1, nw nw nw 9-3n-1w, ½ mi se ext.		4-13-47	6923	6842-	Tensleep sd; Penn	P 850	29		
Carbon		**WYOMING—New Gas Field** Kerr-McGee & Phillips' Unit 1, c se se 10-12n-92w, Baggs Unit.		4-29-47	9512		Ft. Union sd; Eoc	.5 mln			

[1] Character of producing formations abbreviated thus: ch, chalk; dolo, dolomite; li, limestone; sd, sandstone; sh, shale; ser, sepentine; cgl, conglomerate. Ages of formations abbreviated thus: Pleis, Pleistocene; Plio, Pliocene; Mio, Miocene; Olig, Oligocene; Eoc, Eocene; U. Cre, Upper Cretaceous; L. Cre, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian; U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.
[2] Barrels of oil per day (24 hr. rate), flowing (F), pumping (P), swabbing (Sw), or bailing (B); or million cubic feet of gas daily open flow capacity; size of choke given in inches. [3] Type structure abbreviated as follows: Ant, Anticline; D, Dome; Fld, Fold or Folded; Flt, Fault or Faulted; M, Monocline; N, Nose; SD, Salt Dome; Str trp, Stratigraphic trap; Syn, Syncline; Ter, Terrace. [4] Method of discovery abbreviated as follows: cd, core drilling; dr, drilling; geol, geology; geop, geophysics; grv, gravity meter; ran dr, random dril ing; seis, seismograph; sub, subsurface geology; sur, surface geology; tb, torsion balance.



In the Field or

In the Refinery...



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U. S. Daily Crude Output Exceeds 5 Million Mark for Second Week

U. S. daily crude production in the week ended May 17 hit a new all-time high as daily output exceeded the 5-million barrel mark for the second consecutive week, The API reported. Refinery operations were stepped up to boost the manufacture of gasoline and light fuel oils, and product stocks began to follow normal seasonal trends.

Daily crude production in the week of May 17, averaged 5,008,000 barrels, the highest level of all time. This was an increase of 3000 barrels daily over the previous high of 5,005,000 barrels set in the previous week. Compared with production a year ago, current output represented an increase of 257,000 barrels daily or 5.4 percent.

Runs to refinery stills averaged 4,867,000 barrels daily, an increase of 27,000 barrels a day over the previous week's runs and 120,000 barrels over runs of last year's week. Stocks of refinable crude totaled 236,500,000 barrels on May 10, the Bureau of Mines announced. That total was 640,000 barrels lower than the previous week's figure, but 14,885,000 barrels or 6.7 percent higher than stocks a year before.

A step-up of 171,000 barrels raised the week's gasoline production to 14,522,000 barrels, which was 359,000 barrels or 2.5 percent more than was produced in the like period of last year. Stocks of finished and unfinished gasoline were lowered 1,141,000 barrels to 99,793,000 barrels at the week's end. Those stocks exceeded stocks of a year ago by 3,587,000 barrels or 3.7 percent.

Output of distillate fuel oils was raised 148,000 barrels over the previous week to total 5,662,000 barrels, which was also 170,000 barrels or 3.1 percent more than output of last year's week. During the week 481,000 barrels of light fuel oil were sent to tanks boosting stocks' total to 33,844,000 barrels. That amount was 736,000 barrels or 2.2 percent more than inventory a year ago.

Production of residual fuel oil for the week amounted to 8,217,000 barrels, which was a slight drop of 7000 barrels from the previous week's but was 18,000 barrels more than was produced a year ago. Stocks of residual were increased 1,515,000 barrels bringing them to 44,390,000 barrels. Those stocks were 2,878,000 barrels or 6.9 percent higher than those being held a year before.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
1947	[1]5,008	5-17	4,986	3-15	237,140	5- 3	107,576	3-29	58,034	1- 4	53,285	1- 4
Lows:												
1945	3,621	10- 6	3,409	10- 6	[2]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	4-11	4,667	4-12	220,313	2- 8	94,882	1- 4	31,470	4-19	42,668	4-26

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 22	4,786	4,860	224,580	14,668	103,904	5,929	40,739	8,542	44,919
March 29	4,865	4,843	227,529	14,396	107,576	5,969	32,737	8,668	43,364
April 26	4,930	4,725	235,383	14,213	103,860	5,435	32,286	8,186	42,668
May 3	4,951	4,816	237,140	14,383	103,505	5,294	31,899	7,836	42,944
May 10	5,005	4,840	236,500	14,351	100,934	5,514	33,363	8,224	42,875
May 17, 1947	**[1]5,008**	**4,867**		**14,522**	**99,793**	**5,662**	**33,844**	**8,217**	**44,390**
May 18, 1946	**4,751**	**4,747**	**[3]221,615**	**14,163**	**96,206**	**5,492**	**33,108**	**8,199**	**41,512**
Change:									
In Week	+3	+27	—640	+171	—1,141	+148	+481	—7	+1,515
In Year	+257	+120	+14,885	+359	+3,587	+170	+736	+18	+2,878
In Year	+5.4%	+2.5%	+6.7%	+2.5%	+3.7%	+3.1%	+2.2%	+0.2%	+6.9%

[1] All time peak. [2] Lowest since December, 1921. [3] Stocks, May 11, 1946

Some Ohio Crudes Priced 34 Cents Per Barrel Higher

Some Ohio crude oils were priced 34 cents per barrel higher by a recent announcement of Standard Oil Company (Ohio). Last week's rise in Pennsylvania-grade crude initiated by Joseph Seep Agency was quickly followed by most large purchasers in the area, and refiners are now contemplating effects on their products.

Standard announced an increase of 34 cents per barrel to new posting of $2.35 per barrel for Cleveland, Chatham and Lodi crudes produced in Summit, Lorain, Medina and Cuyahoga counties, Ohio. The raise became effective May 15.

Valvoline Pipe Lines advanced the price it will pay for Bradford and Tiona crude from $3.91 to $4.05 per barrel and from $3.78 to $3.92 for Middle District. The same company raised Southwest District and West Virginia crudes 14 cents to $3.84 per barrel, but no action had been taken on Ohio crude by this purchaser. Other purchasers that met the 14 cents advance were The Pennzoil Company, The Pure Oil Company and Tide Water Associated Oil Company.

Pennsylvania-grade crude prices are now highest since June, 1929, when the See- Agency posted price of $4.10 per barrel for Bradford-Allegany crude. The last previous change in prices was a 10-cent hike in all grades April 1.

Prices for regular-grade gasoline ranged higher in the lower field of Pennsylvania following one refiner's advance of .25 cent from 8.25 cents. Two lower field refiners now post 8.5 cents while other quotations range from 8.75 to 9.25 cents. Although no changes have been announced, most refiners expect much firmer prices on lube oils following the crude price increase.

On the Gulf Coast, two suppliers now ask 6.75 cents for kerosine after advancing .25 cent, while one continued to quote 7 cents. Five suppliers now quote 5.75 cents for No. 2 fuel oil, while two said they expect to sell for 6 cents. Gas oil quotations ranged .125 cent higher.

Higher prices for No. 6 fuel were reported in several areas of Texas during the week as demand continued strong for heavy fuel oils. One North Texas refiner advanced his posting from $1.64 to $1.90 per barrel. Another in West Texas reported increasing his price 20 cents to $2, which resulted in a new No. 6 fuel price range of $2 to $2.10.

• Kansas

Oil Pool Opened Mile South Of Kramer-Stern Production

Butler County wildcat opens oil pool; Cowley County wildcat tests Bartlesville zone; Saline County test assigned 387-barrel potential; Barton County test fails.

Butler County: An oil pool has been opened a mile south of the Kramer-Stern pool by J. M. Huber Corporation and associates. Garland 1, SW SE NW 15-28s-6e, pumped 35 barrels per day from the Viola lime, from 3023-25 feet. Total depth is 3038 feet.

Cowley County: The Mid-Plains Oil Company and Veeder Supply Company were testing Reidy 1, NE NW NW 15-32s-7e, 3 miles north of the Countryman pool. Good saturation was logged in the Bartlesville sand, topped at 2917 feet. Five-inch casing was set and cemented on top of the zone and testing will continue.

Saline County: Lowell Drilling Company's Marymount 1, Salina pool, NE NW NE 18-14s-2w, has been assigned a permanent potential of 387 barrels of oil daily from the Viola lime, from 3169-71 feet. The test formerly carried an initial potential of only 44 barrels daily.

Barton County: An attempt to extend the Carroll pool north has failed. Anderson-Prichard Oil Corporation et al's Eveleigh 1-A, SW SW SE 15-17s-14w, has been abandoned at 3450 feet. Lansing was topped at 3168 feet, Sooey conglomerate at 3403 feet, and Arbuckle at 3439 feet.

• Oklahoma

Record Test in Garvin County Making 30 Feet of Hole Daily

World's deepest test making 30 feet of hole per day; new pool or extension assured in Garvin County; wildcat in Harper County may affect future development in the Laverne area; new oil field apparent in Cotton County; important Carter wildcat deepening to Hunton lime.

Caddo County: The Superior Oil Company of California is drilling at the rate of 30 feet of hole each 24 hours in Weller 51-11, NW NW NE 11-8n-12w. The record test was drilling below 17,600 feet on May 19 and no further difficulties have been encountered. The test has made 364 feet of hole since successful completion of the world's deepest fishing job at 17,236 feet on May 5. The well is in the southeastern portion of the huge Anardako basin, where many geologists believe as much as 25,000 feet of sediments exist.

Garvin County: A new oil pool, or a mile extension of the East Antioch field of Western Garvin County, is assured. James N. Crofton's Loretta 1, SE SE SE 7-3n-1w, flowed an estimated 40 barrels of oil per hour through 1-inch choke from the Bromide sand, with casing perforated at 5170-210 feet. Total depth is 5283 feet, with casing set on bottom. Operators had 40 feet of first Bromide zone, with 10 feet of well-saturated sand, and 6 feet of limey sand also saturated. The zone differs from that found in East Antioch proper, in that the field pay is broken sand and sandy lime. The well is a mile northeast of the pool proper.

Harper County: A wildcat in this county may have a profound affect on the Laverne area. The well will be drilled to around 5300 feet, where a sand is producing gas and distillate at another well in the area, with a contract depth of 7200 feet or the Mississippi lime. The test is the J. M. Huber Corporation et al's Heironymous, CNW SE 3-26n-24w. The producing well is Sinclair Prairie Oil Company's Howell 1, CSW SW 14-26n-24w, which was completed for 11 million cubic feet of gas and some distillate a day in 1930 after drilling to 8759 feet, junking the hole and plugging back to 5400 feet.

Cotton County: Kerr-McGee Oil Industries apparently have opened a new pool in the south-central portion of the county with the Cotton 1, NE NE NW 33-3s-11w, between the West Soldier Creek and the North Rose Valley fields. The well on initial test swabbed 5 barrels of oil an hour from total depth of 1508 feet in sand. The company is planning a 3000-foot test on the same block.

Elmore Area: The Carter Oil Company is deepening Helvy 1, SE NW 25-2n-2w, wildcat which missed pay of the Katie and Southwest Antioch pools and failed to connect these pools. The test will be carried to the Hunton lime, and is now drilling below 6771 feet in sandy shale. The well was expected to pick up the Gibson sand, producing zone of the 2 fields, and geologists felt the well would connect the 2 pools on a shoreline trend.

Gulf Publishing Company Officials Are Elected

Officers of The Gulf Publishing Company were elected at a recent meeting of the company's Board of Directors as follows: Ray L. Dudley, president; A. L. Burns, vice president and general manager; Tom W. Nelson, second vice president; R. P. Swinsky, vice president; Warren L. Baker, secretary; L. J. Logan, assistant secretary; P. J. Aucoin, treasurer; and Robert V. Turner, assistant treasurer.

At the company's annual stockholders meeting, which immediately preceded the board meeting, the following were elected directors of the company: Ray L. Dudley, James Anderson, Charles H. Lane, A. L. Burns, T. W. Nelson, Warren L. Baker, William Hudspeth, R. P. Swinsky, and P. J. Aucoin.

Wells Completed in the United States in Week Ended May 17, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells: Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS: Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	This Week 1946
Alabama	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Arkansas	2	....	....	....	....	2	1	....	....	....	3	3	6	5	4
California	27	....	....	....	1	28	3	....	....	....	2	2	33	39	38
Colorado	2	....	....	....	....	2	....	....	....	....	1	1	3	3	2
Florida	....	....	....	....	....	....	....	....	....	....	1	1	1	....	....
Georgia	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Illinois	15	....	....	....	4	19	....	....	....	....	6	6	25	24	41
Indiana	5	....	....	....	2	7	....	....	....	....	7	7	14	10	7
Kansas	22	....	2	....	12	36	1	1	....	....	6	7	44	44	37
Kentucky	10	....	....	1	4	15	....	....	....	....	4	4	19	6	11
Louisiana	19	1	....	....	6	26	2	2	....	1	5	8	36	27	23
N. Louisiana	8	1	....	....	6	15	....	....	....	1	2	3	18	19	14
S. Louisiana	11	....	....	....	....	11	2	2	....	....	3	5	18	8	9
Michigan	8	....	....	....	1	9	....	1	....	....	4	5	14	6	20
Mississippi	3	....	....	....	1	4	....	....	....	....	2	2	6	22	3
Montana	4	....	....	....	....	4	....	1	....	....	....	1	5	4	11
New Mexico	8	....	2	....	1	11	....	....	....	....	1	1	12	15	7
New York	14	....	1	16	1	32	....	....	....	....	....	....	32	31	25
Ohio	6	....	9	....	7	22	1	....	....	....	1	1	24	19	18
Oklahoma	37	....	2	2	15	56	4	....	....	....	9	9	69	79	61
Oregon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Pennsylvania	20	....	16	22	5	63	....	....	....	....	....	....	63	62	54
Texas	82	1	5	2	23	113	1	4	2	....	18	24	138	198	159
Districts:															
1—S. Central	2	....	....	....	....	2	....	....	....	....	4	4	6	6	2
2—Middle Gulf	3	1	....	....	6	10	....	2	....	....	....	2	12	17	[1]
3—Upper Gulf	5	....	1	....	1	7	....	1	....	....	4	5	12	14	11
4—L. Gulf-S.W.	15	....	3	1	4	23	....	....	2	....	4	6	29	19	33
5—E. Central	1	....	....	....	....	1	....	....	....	....	1	1	2	....	[2]
6—Northeast	4	....	....	....	1	5	....	....	....	....	....	....	5	13	16
7-B—N. Central	3	....	....	....	2	5	....	....	....	....	1	1	6	20	[3]
7-C—W. Central	3	....	....	....	....	3	....	....	....	....	1	1	4	1	[4]
8—West	28	....	....	....	4	32	1	1	....	....	2	3	36	57	29
9—North	13	....	....	1	5	19	....	....	....	....	1	1	20	47	60
10—Panhandle	5	....	1	....	....	6	....	....	....	....	....	....	6	4	8
Washington	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
West Virginia	....	....	10	....	1	11	....	....	....	....	....	....	11	11	10
Wyoming	3	....	....	....	....	3	....	....	....	....	....	....	3	1	2
Total U. S.	287	2	47	43	84	463	13	9	2	1	70	82	558	606	537

* Includes salt water disposal wells. [1] Middle Gulf included with Lower Gulf-S.W. [2] East Central included with Northeast. [3] North Central included with North. [4] West Central included with West.

• West Texas

Ellenburger Prospects Deepen Before Setting Oil String

Prospective Ellenburger discoveries in Scurry and Crockett counties deepening before setting oil string; Ellenburger wildcat in Winkler County plugging back to Clear Fork; Petersburg field to be small; Clear Fork pay in TXL field offers possibly 70 proved undrilled locations.

Scurry County: The Ohio Oil Company's Neal 1-C, R. N. Miller Survey 1 and an isolated wildcat, was coring below 7290 feet after several drill-stem tests yielded nominal amount of oil- and gas-cut mud from Ellenburger, topped near the 7230-foot level with elevation of 2164 feet. This wildcat attempted to clean itself due to thinning of rotary mud upon entering the first pay zone.

Crockett County: Amerada Petroleum Corporation's University 1-C-T-A, C SE SW Sect. 23, Block 42, and initial test for a geophysical prospect that resulted in the payment of unusually high cash bonuses for leases in the area, was drilling at 8628 feet to establish the water table before setting pipe for production test. This wildcat entered the Ellenburger broke pay near the 8168-foot level, with elevation 2613 feet. Routine drill-stem tests were not taken due to crooked section of hole near the 2800-foot level. Considerable porosity and oil staining have been logged in the upper sections of the Ellenburger.

Cities Service Oil Company et al's Owens 1-B, wildcat between the Clara Couch and Olson fields that made prolific flow of oil and gas from the Crinoidal (Pennsylvanian), then tested water in Ellenburger, topped at 6830 feet, and was drilling at 7860 feet. It is due to drill through the Ellenburger before plugging back for completion.

Crane County: Gulf Oil Corporation's University 1-HH, discovery for the University-Waddell field, flowed 92 barrels of 42.3-gravity oil and 5 barrels of rotary fluid, with gas-oil ratio of 1282/1, on 19-hour natural test through ½-inch choke from perforations at 10,760-90 feet, having plugged back from water at 11,060 feet. Top of the pay is near the 10,625-foot level.

Winkler County: Amon G. Carter et al's Wight-Gulf 1, wildcat that was temporarily a contender for producing depth honors in the Permian Basin is testing 5 barrels of oil daily from Ellenburger at 12,265-359 feet, deepened to water at 12,409 feet. It is slated to be plugged back for production test through perforations opposite the 6700-foot Clear Fork oil zone.

Hale County: Stanolind Oil & Gas Company's Stine 1, C SW NE E.L.&RR Co. 6, Block CL, ¾ mile northwest of the Petersburg field's flowing discovery from Cisco (Pennsylvanian) at 6890-992 feet, was drilling at 7130 feet in Cisco, topped at 7115 feet, with elevation 3320 feet. The Cisco correlates 226 feet low. Stanolind's LaFont 1, recent failure and southeast offset to the discovery, entered the Cisco 251 feet low. Standard Oil Company of Texas and Humble Oil & Refining Company's Hunt 1, west by south of the discovery, showed unusually brackish water in Wolfcamp, topped at 5995 feet, and was drilling shale at 6430 feet, correlating 70 feet low.

Gaines County: Honolulu Oil Corporation's White-Shelton 1, wildcat and 4¼ miles northwest of Cities Service's Riley 1, pumping discovery from Clear Fork at 7039-237 feet, was drilling at 6840 feet after testing nominally oil- and gas-cut mud without water at 6590-730 feet. Honolulu's Kirschner 1, a mile west by north of its prospect, was drilling lime at 4470 feet.

Amerada's Jones 2-A, highest structurally and an Ellenburger test for the Jones Ranch field, was drilling at 12,264 feet, having cemented 7⅝-inch casing at 11,817 feet to protect Devonian pay.

Terry County: Amerada's Elkins 1, west offset to its San Andres pumping discovery at 4850-925 feet for the Adair field, was drilling the San Andres at 4605 feet, and checking about flat. The discovery developed natural flow the past week, and was flowing 200 barrels daily through 25/64-inch choke.

Ector County: Phillips Petroleum Company's TXL 1-M, wildcat and 4¾ miles west of the deep producer in the Goldsmith field, recovered prolific head of sulphur water at 10,845 feet in Ellenburger, topped at 10,785 feet, with elevation 3263 feet. The hole may be plugged back for a further test of the oil and gas showings passed up in the Clear Fork at 6970-7060 feet. Gulf's Goldsmith 421-D, Devonian pay discovery for the Goldsmith field, was acidized due to the flow declining below allowable from perforations at 7980-90 feet, and boosted the oil yield to 266 barrels, with gas-oil ratio 318/1, on ½-inch choke, but the water increased to 493 barrels daily.

Shell Oil Company's TXL-Lion 1-H, C SW SW T&P 39, Block 45, T-1-S, ¾ mile south of Clear Fork production in the TXL field, pumped 147 barrels of 37.5-gravity oil initial after acidizing Clear Fork open hole at 5540-5765 feet. This is the seventh producer for the upper pay, which extends north-south 3 miles and a maximum width of 2 miles. The Clear Fork proved area will permit the drilling of 50 to 70 additional wells to this zone, providing operators elect to drill twin wells to their Devonian and Ellenburger producers.

Humble's Yarborough-Allen 1, Ellenburger prospect for southwestern Ector County, was drilling lime and chert at 8230 feet, with the Silurian as its next probable oil zone. Cities Service and Sinclair's Wooten 1, 1½ miles northeast and a 7700-foot prospect, was drilling at 4180 feet, and correlating about 100 feet low on upper markers.

Property Sale: San Andres Production Company entered the Sharon Ridge 1700 field, Scurry County, in paying $235,000 cash for adjoining 160-acre leases owned by C. T. McLaughlin et al and French M. Robertson, Bill Knode and H. M. Prior. Each lease has 4 completed pumpers. Purchaser has authorized the drilling of 14 additional wells, including 2 under way.

May Demand for Crude Shows Considerable Gain

Domestic crude production this month will have to be raised 21,000 barrels a day over April to meet demand, it was forecast last week by the Bureau of Mines.

Predicting a requirement of 4,871,000 barrels daily, as compared with 4,850,000 in April and 4,796,500 actually required in May, 1946, the bureau split the increase between five states, with 15,000 barrels daily, or more than half, coming from California, 2000 barrels, each, from Wyoming and Mississippi, and 1000 barrels, each, from Louisiana and Colorado.

The bureau found that actual demand in February was 4,775,000 barrels daily, with a crude production of 4,810,000 daily, and estimated that for March demand was 4,810,000 barrels daily with production of 4,880,000, and for April demand probably was 4,660,000 barrels against a production of 4,950,000 barrels.

Due to strikes and fire losses, runs to stills in April averaged only 4,730,000 barrels daily against a forecast of 4,890,000 barrels, and may be considerably less than the 4,920,000 barrels forecast for May.

• West Central Texas

Shackelford Wildcat Tests Deepest of Promising Pays

Shackelford County wildcat tests deepest of 2 promising pays; Strawn pumper assured for shallow gas area in south part of county; Ellenburger test under way for the Wimberly multi-pay field.

Shackelford County: McCarthy Oil & Gas Corporation's Newton 1, Sect. 57, Bayland Orphan Asylum Lands, was plugging back after testing an undisclosed volume of oil and water from the Ellenburger section at 3995-4053 feet. This wildcat also indicated probable production in the Bend section.

E. E. Fogelson and M. S. Ingleright's Lones 1, C SE NW T&P 64, Block 11, offsetting shallow gas production, was installing pumping unit after nitro shot in Strawn sand at 3075-80 feet. The well headed oil occasionally while cleaning out after shot. It was drilled to 4336 feet in Ellenburger, topped at 4301 feet, but the latter zone tested a hole full of water.

Jones County: West Central Drilling Company et al's Wimberly 7-A, near center of the Wimberly field, largest source of production in the district, has spudded as a scheduled Ellenburger test. The location is immediately east of the apex of the structure, which is producing from 8 oil zones. The deepest penetration of the Pennsylvanian section involves Bill Brookover's Church 3, a nearby producer drilled to 2646 feet, and plugged back. All operators in the field proper are contributing to the cost of the deep test on a basis of allowable production.

P. P. Manion Named Chairman Of Mid-Continent AIME

P. P. Manion, Jr., Stanolind Oil & Gas Company, has been selected chairman of the Mid-Continent Section, AIME, for the 1947-48 term.

Other officers include John P. Hammond, Amerada Petroleum Corporation, first vice chairman; J. J. Arps, The British American Oil Producing Company, second vice chairman; Russell H. Gwinner, Sunray Oil Corporation, secretary-treasurer.

Members of the executive committee from Tulsa include Ed Shakely, Shell Oil Company; J. N. McGirl, Tide Water Associated Oil Company, and J. Murray Walker, Lane-Wells Company. Members of the executive committee outside Tulsa include C. Kenneth Eilerts, U. S. Bureau of Mines, Bartlesville, Okla., and G. R. Elliott, Phillips Petroleum Company, Bartlesville.

Ex-officio officers of the executive committee are R. C. Earlougher and L. E. Elkins, Tulsa.

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Here, for the first time, is a comprehensive attempt to show actual *usable* horsepower ratings for various oil field services. By referring to the following tables, any operator can tell at a glance just what power he *will get* from any BUDA Oilfield Engine Model...data never before offered by an engine manufacturer.

BUDA NATURAL GAS OIL FIELD ENGINE SERVICE RATINGS

Model	Maximum HP @ RPM	65% Production Pumping HP @ RPM	70% Pipe Line Pumping HP @ RPM	75% Mud Pumps HP @ RPM	80% Drilling Hoisting HP @ RPM	85% Well Servicing HP @ RPM
4-B-153	49 @ 2800	22 @ 1600	24 @ 1600	28 @ 1800	33 @ 2000	39 @ 2400
6-B-230	73.5 @ 3200	31 @ 1600	34 @ 1600	40 @ 1800	46 @ 2000	56 @ 2400
HP-326	79.5 @ 2600	37 @ 1400	40 @ 1400	48 @ 1600	55 @ 1800	62 @ 2000
K-428	108 @ 2400	48 @ 1400	52 @ 1400	62 @ 1600	72 @ 1800	83 @ 2000
L-525	113 @ 2400	57 @ 1400	61 @ 1400	72 @ 1600	83 @ 1800	93 @ 2000
LO-525	157 @ 2400	67 @ 1400	72 @ 1400	87 @ 1600	101 @ 1800	114 @ 2000
JL-1335	194.5 @ 1350	109 @ 1000	117 @ 1000	134 @ 1100	150 @ 1200	164 @ 1300
MO-893	188 @ 1800	100 @ 1200	107 @ 1200	128 @ 1400	141 @ 1500	150 @ 1800
PC-1879	242 @ 1200	142 @ 900	153 @ 900	175 @ 1000	192 @ 1100	206 @ 1200
6-PCG-1879†	340 @ 1200	172 @ 900	185 @ 900	220 @ 1000	256 @ 1100	289 @ 1200
PCS-1879*						

*Supercharged †Convertible

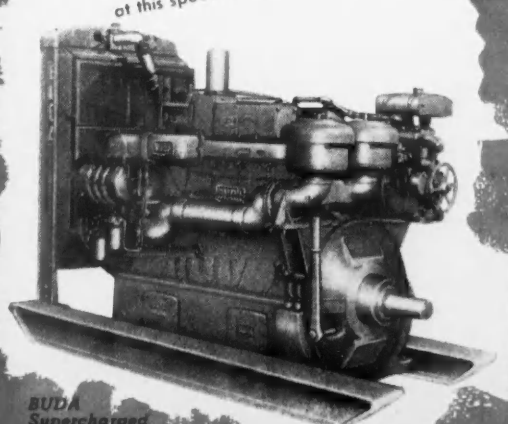
NOTE: Engine speeds shown for various types service are MAXIMUM recommended. Many operators prefer lower speeds for longer engine life. In these cases select desired engine operating speed and refer to Maximum HP shown on Buda oil field power curve and take percentage (%) of Maximum HP shown above for each type service. Ex: assume it is desired to operate Model HP-326 in "pipeline service" at 1200 RPM Power curve shows 50 BHP at this speed. Taking 70% of 50 BHP = 35 usable HP @ 1200 RPM.

BUDA DIESEL OIL FIELD ENGINE SERVICE RATINGS

Model	Maximum HP @ RPM	65% Production Pumping HP @ RPM	70% Pipe Line Pumping HP @ RPM	75% Mud Pumps HP @ RPM	80% Drilling Hoisting HP @ RPM	85% Well Servicing HP @ RPM
4-BD-153	40 @ 2400	20 @ 1600	22 @ 1600	26 @ 1800	29 @ 2000	33 @ 2200
6-BD-230	60 @ 2400	31 @ 1600	33 @ 1600	38 @ 1800	44 @ 2000	49 @ 2200
6-DT-317	90 @ 2300	44 @ 1600	48 @ 1600	57 @ 1800	65 @ 2000	77 @ 2200
6-DT-468	113 @ 2000	59 @ 1400	63 @ 1400	72 @ 1500	80 @ 1600	92 @ 1800
4-DC-645	119 @ 1400	62 @ 1100	67 @ 1100	78 @ 1200	83 @ 1200	101 @ 1400
6-DC-844	180 @ 1800	89 @ 1200	96 @ 1200	117 @ 1400	131 @ 1500	153 @ 1800
6-DCS-844*	225 @ 1800	109 @ 1200	117 @ 1200	145 @ 1400	164 @ 1500	192 @ 1800
8-DC-1125	240 @ 1800	119 @ 1200	128 @ 1200	157 @ 1400	176 @ 1500	204 @ 1800
8-DCS-1125*	300 @ 1800	145 @ 1200	156 @ 1200	194 @ 1400	218 @ 1500	255 @ 1800
6-DC-1879	258 @ 1200	140 @ 900	150 @ 900	174 @ 1000	198 @ 1100	218 @ 1200
6-PCD-1879†	330 @ 1200	174 @ 900	187 @ 900	218 @ 1000	251 @ 1100	281 @ 1200
6-DCS-1879*						

*Supercharged †Convertible

NOTE: Engine speeds shown for various types service are MAXIMUM recommended. Many operators prefer lower speeds for longer life. In these cases select desired engine operating speed and refer to Maximum HP shown on Buda oil field power curve and take percentage (%) of Maximum HP shown above for each type service. Ex: assume it is desired to pull "Mud pump" with Model 6-DC-844 operating at 1200 RPM Power curve shows 137 BHP at this speed. Taking 75% of 137 BHP = 102 usable HP @ 1200 RPM.



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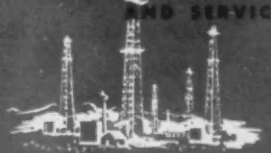

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• North Texas

Jack County Field Test Has Oil Flow from Marble Falls

Jack County field gains new pay in developing oil flow from Marble Falls; second producer in Montague County field has large initial; Kendall field may expand to more than 1000 productive acres in the Bend.

Jack County: S. D. Johnson et al's G. A. Johnson 1, C. Vandever Survey A-867, extended the Lester multi-pay field east and established new pay in showing for a natural flowing well from Marble Falls at 4966-77 feet. The well was shut in without a gauge after cleaning itself of rotary fluid. The area also produces from the Bend conglomerate and Mississippian.

Continental Oil Company's Shawver 1, John Frazier Survey A-214, and 2½ miles east by north of Perrin, was setting cable tools to try for completion in conglomerate after plugging back from 5506 feet to 5390 feet, with pipe set at 5349 feet. This wildcat logged possible production at 5352-67 feet.

Montague County: L. S. Youngblood and R. L. Foree's Benton 3, offset to their Caudle field discovery in the Abel A. Lewis Survey A-420, flowed 1632 barrels of 43-gravity oil initial through ¾-inch choke from perforations at 6130-40 feet in Bend, topped at 6058 feet, or 25 feet low. Benton 3 was drilled to 6714 feet to try for deeper production, and entered Viola at 6550 feet.

Continental's Magee 1, C. A. Wright Survey A-1052, and a Strawn discovery, flowed 100 barrels daily through ⅛-inch choke from perforations at 6018-38 feet after plugging back from 6640 feet. Pumping unit was being installed in order to assure the top allowable.

Young County: Warren Petroleum Corporation's Allar Company 1-H northeast corner of S ½ of J. Cosby Survey A-1723 and west offset to the most westerly bend 3500-foot producer in the Kendall field, established deeper pay, flowing 75 barrels of oil hourly natural on 1-inch choke from open hole at 4188-95 feet. Production possibilities of this lower zone were indicated by showings logged by a structurally-low failure ½ mile south. The Bend producing sector of the field extends 2 miles east-west to include the east extension opened by John T. Cox and Turner & West's Davis 1, which has since been offset by flowing wells. The proved and prospective area will support a large drilling program while the field proper has not been explored below the 3500-foot Bend. The above operators and Roy H. King are the largest lease owners.

• East Texas

Quitman Test Finds Salt Plug Above Smackover Objective

Quitman field deep test encounters salt plug above Smackover objective; Bowie County wildcat nearing decisive level in Paluxy; Glen Rose proves disappointing in Houston County wildcat.

Wood County: Shell Oil Company's Goldsmith 12, projected Smackover test for the Quitman field, confirmed the presence of salt in drilling to 11,283 feet, and will be plugged back for production test of possible gas-distillate zone in Basal Rodessa near the 8400-foot level. The salt plug was entered at 11,160 feet after logging Cotton Valley below the 9760-foot level.

Humble Oil & Refining Company's McKnight 1, northeast edge of the Hawkins field, was drilling shale and lime at 13,680 feet. Permit has been obtained to deepen to 14,000 feet, if necessary, to explore the Smackover for production.

Humble's Rio Oil Corporation's 1, Jesse Walker Survey and a Travis Peak test for the Yantis prospect, which has recorded a Paluxy failure, was drilling at 5760 feet in Georgetown, topped near the 5010-foot level, with elevation 398 feet. It correlates low to George Strake's nearby 6506-foot Paluxy failure.

Houston County: Magnolia Petroleum Company's Grounds 1, J. C. Luce Survey and 6 miles southeast of Grapeland, was due to perforate at 8395-435 feet in the upper section of the Glen Rose, topped at 8232 feet, after testing small amount of oil from Lower Glen Rose perforations at 8922-45 feet. The latter zone was treated with 14,000 gallons of acid by stages. Grounds 1 was drilled to 10,436 feet in barren Rodessa, then set pipe at 9009 feet on the strength of the shows in the Glen Rose, which rarely yields commercial production in the district.

Bowie County: Tide Water Associated Oil Company and Seaboard Oil Company's Dalby-Joiner 2, D. Puckett Survey and southeast offset to their recent 4825-foot Paluxy failure, was drilling at 4505 feet and reported to have entered the upper section of the Paluxy series with some evidence of gas. This second test was located to intercept the Paluxy fault on the upthrow side.

Freestone County: The Texas Company's White 1, Fairfield area and record-depth test for the district, was testing new perforations in the Cotton Valley at 11,128-42 feet. Previous tests at lower levels in the zone yielded a nominal show of gas with water.

Navarro County: J. L. Collins & Company's Barnett-Magnolia 1, B. G. Balthrope Survey and near Woodbine gassers in the Bazette area, was drilling at 4455 feet, having topped Paluxy at 4210 feet and Glen Rose at 4410 feet. It will explore the Travis Peak sandstone.

San Augustine County: M. E. Davis' (Benedum & Trees) W. A. Johnson 1, Edmund Quirk Survey, 6 miles north of San Augustine, obtained 750 feet of pipe line oil on a drill-stem test of 8150-65 feet. The well was drilling toward the Travis Peak at 8580 feet, and has had no further showings below the 8100-foot interval in the Pettit lime. Leasing has become very active in the area.

Marion County: Magnolia Petroleum Company's Hall Estate 1, M. W. Moody Survey, Lassater field, perforated 2½-inch tubing set on bottom at 8754 feet, plug back depth, washed and swabbed, and began to flow gas and wash water. Recovery, when turned into tanks, was 52 barrels of 60.8-gravity distillate and 2,350,000 cubic feet of gas per day through 18/64-inch choke on tubing. Operators were testing further. This is the second well in the field. Total depth is 10,241 feet.

THE OIL MAN'S CALENDAR

MAY 27–30	Texas A. & I. College, Second Annual Course in Gas Technology. Kingsville.
JUNE 5– 6	Pennsylvania Grade Crude Oil Association Annual Meeting, Pittsburgh, William Penn Hotel.
16–19	ASME Semi-Annual Meet, Chicago, Stevens Hotel.
25	Rocky Mountain District API Division of Production, Yellowstone National Park, Mammoth Hotel.
26–27	Quarterly Executive Conference, Rocky Mountain Oil and Gas Association Directors Yellowstone National Park, Mammoth Hotel.
26–27	Kentucky Oil & Gas Association Annual Meeting, French Lick, Ind., French Lick Hotel.
JULY 31-AUG. 1, 2	Interstate Oil Compact Commission, Montana. (City to be selected)
25–27	Annual Appalachian Gas Measurement Short Course, West Virginia University School of Mines, Morgantown.
SEPT. 29–30	Annual Meeting Independent Petroleum Association of America, Oklahoma City.
28 to Oct. 2	Regional Meeting, AIME (includes 2-day Petroleum Division Session), Denver.
29 to Oct. 3	American Gas Association, Annual Convention, San Francisco.
8–10	Fall Meeting, Petroleum Division, AIME, Tulsa, Mayo Hotel.
13–15	Annual Meeting, American Association of Oil Well Drilling Contractors, Long Beach, Calif.
23–24	Fall Meeting, Petroleum Division, AIME, Los Angeles, Elks Club.

Nomads Chapter monthly meetings: LOS ANGELES, second Wednesday, Mayfair Hotel. HOUSTON, second Monday, Ye Olde College Inn. NEW YORK, first Monday, Louis Sherry's. TULSA, third Wednesday, Hotel Tulsa. DALLAS, date not yet fixed.

Program Being Arranged For Rocky Mountain API

The preliminary program for the meeting of the recently revived Rocky Mountain District of the American Petroleum Institute, Division of Production, to be held in the Mammoth Hotel, Yellowstone National Park, Wyo., June 25, has been announced by R. B. Curran, district chairman.

Papers are planned on "Drilling Practices in the Rocky Mountain Area"; "Secondary Recovery Activities," and "Unit Operations," authors to be announced later. James D. Anderson, Ohio Oil Company, Casper, Wyo., is program committee chairman.

• Southwest Texas—Lower Coast

Field Discovered Northwest Of Banquete, Nueces County

New field discovered northwest of Banquete in Nueces County; potential test run on Turkey Creek wildcat; Cam field extension makes production tests; new deep pay zone discovered at Alta Mesa; outpost on La Gloria's east flank flows oil.

Nueces County: Curtis Singleton and W. H. Wallace's Mantor & Briggs 1, wildcat 4 miles northwest of Banquete, has been completed as a discovery. The well flowed at the rate of 240 barrels of 32.2-gravity oil daily on a drill-stem test lasting 10⅓ hours. Flow was through 3/16-inch top and ¼-inch bottom choke with 1100 pounds working pressure. Total depth is 6686 feet with

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5½-inch casing set on bottom. The drill-stem test was made of perforations at 6016-21 feet. Previously, the well flowed gas and condensate on a drill-stem test of perforations at 4950-61 feet, open 1 hour, and developing 1700 pounds working pressure on ¼-inch choke top and bottom. This new field is 1139 feet from the northwest line and 2798 feet from the southwest line of Block 16, Briggs & Kuykendall Subdivision, 2 miles northwest of North Agua Dulce field and 3 miles northeast of Richard King field.

Renwar Oil Company's McCampbell 1, new discovery approximately ⅓ mile east of Turkey Creek field, has been given potential test. It flowed 40 barrels of 35.5-gravity oil daily, plus 7.9 percent water, through 7/64-inch choke with tubing pressure 1430 pounds, casing pressure 1975 pounds, and gas-oil ratio 6575/1. Total depth is 9014 feet with 5½-inch casing set to 7016 feet and perforated at 5542-52 feet for completion.

Duval County: Southern Mineral's Corporation's Benavides 3, extension 1¼ miles south-southwest of the discovery at Cam field, was testing after flowing oil and salt water initially. From perforations at 2638-48 feet the well flowed 30 barrels of oil daily plus 40 percent salt water. Total depth is 2666 feet with 5½-inch casing set on bottom.

Brooks County: Standard Oil Company of Texas' Mestena 33 has discovered a new deep pay zone at Alta Mesa field. From perforations at 5194-203 feet the well flowed on potential 77 barrels of 45.1-gravity oil daily on 3/16-inch choke. Tubing pressure was 150 pounds, casing sealed, and gas-oil ratio was 881/1.

Jim Wells County: Fidelity Oil and Royalty Company's Russell 1 outpost on the east flank of La Gloria field and about ¾ mile south of townsite oil production, has been completed as an oil producer. The well gauged 205 barrels of 41.8-gravity oil daily on ⅛-inch choke with tubing pressure 800 pounds, casing pressure 950 pounds, and gas-oil ratio 640/1. Total depth is 6270 feet with 5½-inch casing perforated at 6107-13 feet for completion.

Military Leaves Granted

The Standard Oil Company (Ohio) has announced a policy of granting leaves of absence with pay to employes called to active duty at training camp. Any regular full-time employe who has completed a year of continuous service with Sohio and at least one year of continuous active service in the armed forces of the U. S., and who is called to camp or other active duty with the Army, Navy, Marine Corps or a National Guard unit, may be granted such leave of absence up to 15 days a year. Employe will receive his normal base pay for the period of such leave.

• South Central Texas

Edwards Lime Production at Charlotte Field Extended

Edwards lime production at Charlotte extended 1¼ miles northeast; Highland Oil to develop new gas sand at Pearsall; discovery completed in LaSalle County.

Atascosa County: Humble Oil & Refining Company's J. T. Eppright 1, 1¼ miles east-northeast of previous Edwards lime production at Charlotte field, has been completed as a producer. On potential the well flowed 89 barrels of 39.4-gravity oil daily on 3/16-inch choke with gas-oil ratio 72/1. Tubing pressure was 300 pounds, casing sealed. Total depth is 7000 feet with 5½-inch casing set to 6995 feet and completion made in open hole. This discovery is 660 feet from the northeast and southeast lines of a 100-acre lease in J. H. Gibson Survey 1627.

Frio County: Highland Oil Company will drill several new wells in the Pearsall field. All will be drilled to approximately 4400 feet and will develop the 4275-foot Navarro-Taylor gas sand discovered in the company's Halff and Oppenheimer 12. This sand is approximately 400 feet deeper than the regular Navarro pay zone for the field. These wells will be drilled to furnish gas for a new pipe line being built to the field.

LaSalle County: Skinner & Eddy et al's South Texas Syndicate 1-C, wildcat 7 miles south of Washburn field and 15 miles southwest of Fowlerton, has been completed as an oil field discovery. On potential the well pumped 77 barrels of 32.8-gravity oil daily, plus 75 percent fresh water. This well is a rework of the old Quintana Petroleum Company's South Texas Syndicate 1-F dry hole, drilled in April, 1945, and abandoned at 6639 feet. Present completion is from perforations at 3638-58 feet.

• Middle Texas Coast

Kitty Field Area Wildcat Tests 1900-Foot Sand Zone

Wildcat southwest of Kitty field tests 1900-foot sands; wildcat northeast of George West shut in after testing gas and condensate; confirmation at Yoward field cores Slick pay sand with oil show.

Live Oak County: Henshaw Brothers et al's Walter Sippel 1, wildcat ½ mile southwest of Kitty field, was testing sands at the 1900-foot level. Total depth is 2800 feet with 5½-inch casing set to 1970 feet. Prior to setting pipe a drill-stem test at 1388-96 feet recovered 170 feet of oil and mud and 130 feet of salt water in an hour. A test at 1652-56 feet developed 300 pounds working pressure in 10 minutes and recovered 30 feet of mud and brackish water. A test at 1860-65 feet developed 530 pounds working pressure in 15 minutes and recovered 30 feet of oily mud. A test at 1863-69 feet developed 220 pounds working pressure in 22 minutes and recovered 150 feet of oily mud and 150 feet of mud and water.

Stanolind Oil & Gas Company's Pearl Harris 1, wildcat 2 miles north-northeast of George West, was shut in after flowing gas and condensate from perforations at 7370-80 feet. Total depth is 10,020 feet with 5-inch liner set to 9600 feet. A previous test at 8520-30 feet flowed 86 barrels of 48.5-gravity condensate and 6 million cubic feet of gas daily on ¼-inch choke.

Bee County: Gasoline Production Corporation et al's Yoward 1-A, confirmation test 1320 feet northwest of the discovery at Yoward field, topped the slick pay sand at 7525 feet with good oil odor and cut. The Yoward 1 discovery topped the slick sand at 7470 feet and was completed through perforations at 7483-93 feet, flowing 165 barrels of 41.2-gravity oil daily on 9/64-inch choke.

• Upper Texas Coast

Confirmation Test Completed As Oiler in North Cleveland

West confirmation test at North Cleveland completed as oiler; wildcat on big block in Fort Bend County dry; northeast outpost at Midfields being completed as oiler; deep wildcat in Eagle Lake area dry; good producer finaled at Oyster Bayou.

Liberty County: Miles Production Company's Marie F. Theall 1, confirmation well 650 feet west of the Kempner 1 discovery at North Cleveland field, has been given potential test. The well gauged 226 barrels of 39.2-gravity oil daily through 10/64-inch choke with 750 pounds tubing pressure, 990 pounds casing pressure, and gas-oil ratio 550/1. Production is from perforations at 5794-96 feet in a sand topped at 5788 feet.

Fort Bend County: Wesley W. West's Steenbergh 1, wildcat on a big block southwest of Orchard field and south of O'Conner gas production in Wharton County, has been abandoned. Total depth is 7574 feet with no shows encountered.

Matagorda County: Sun Oil Company's G. E. Trull 1, northeast outpost at Midfields field, was being completed as an oil producer. Initially the well cleaned through 6/64-inch choke flowing 44.1-gravity oil with 2700 pounds pressure on the tubing. Total depth is 9177 feet with 5½-inch casing set 2 feet off bottom and perforated at 9129-39 feet for completion.

Colorado County: The Chicago Corporation et al's Dennis 1, deep wildcat in the Eagle Lake area, has been abandoned as dry. Total depth is 11,163 feet with several sands yielding slight show but no permeability. Drill-stem tests were made at 8761-69 feet and 8770-85 feet where salt water was recovered. This dry hole is on a 474-acre lease in the James Earl Survey, 2 miles west of Eagle Lake townsite and 4 miles south of Ramsey field production.

Chambers County: Sun Oil Company's Felix Jackson 20 has been completed as a good producer in the Oyster Bayou field. On initial gauge the well flowed 411 barrels of oil daily on 13/46-inch choke with 1150 pounds tubing pressure and gas-oil ratio 598/1. Total depth is 8375 feet with 5½-inch casing set on bottom and perforated at 8352-62 feet for completion.

Year-Long Preparations for 1948 Exposition Planned

A year-long preparation program for the postwar revival of the International Petroleum Exposition, to be held in Tulsa May 15-22, 1948, has been assured by the Tulsa Fair Board's approval of a ten-year lease on approximately 15 acres of fairgrounds property, to be utilized by the "world's fair of the oil industry."

Board members granted a lease on approximately 14 acres now occupied by the oil show plant, and additional land 100 x 790 feet, immediately north of the exposition grounds. Annual rental consideration was $1000 for a ten-year period.

The largest show in history is expected, with many more foreign countries exhibiting than in previous shows.

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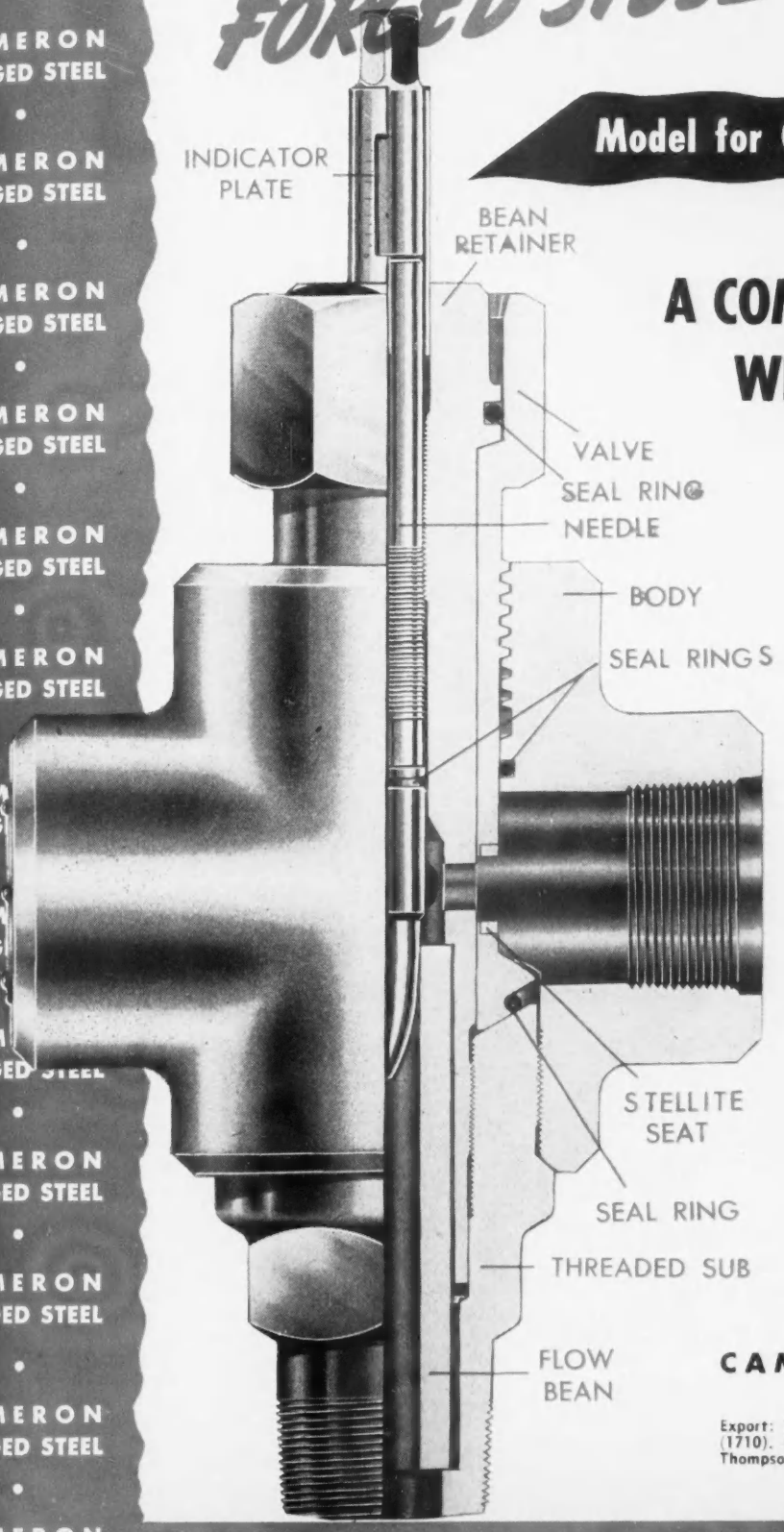

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The Cameron Type "F" Forged Steel Flow-Wing for 3,000 lbs. working pressure is the latest addition to the Cameron line of Flow-Wings. It provides in a single compact unit either an adjustable or positive flow bean plus a wing valve for choke changing. It is illustrated at left fitted with an adjustable flow bean, and may be converted to a positive type choke by simply replacing the needle with a bleeder plug and inserting a positive type bean of the desired size.

In the accompanying illustration, the valve section of the unit is shown in open position. It is closed (see below) by screwing the valve down to its seat, using an all-purpose wrench which fits the hex on the valve stem. A coarse thread is provided between the valve stem and body for speedy opening and closing of the valve. The valve and its seat are faced with hard metal to resist cutting. All component parts of the unit may be replaced in the field without removing the flow-wing from the well.

The bean retainer, which screws inside the valve stem, may be easily removed when it is necessary to replace beans, utilizing the same wrench as above. As a safety measure, it is impossible to remove the flow bean unless the valve is in closed position.

An indicator plate, graduated in increments of 1/64-inch, is provided to facilitate adjustment of the choke to meet production requirements. The all-purpose wrench also fits the adjustable choke stem.

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Close valve section.

Back out bean retainer.

Bean comes out with retainer.

Replace bean and reverse operations.

• South Louisiana

Beauregard Parish Has New Cockfield Producing Area

New Cockfield producing area discovered in Beauregard Parish; new pay sand discovered at Alliance; Richardson's Plaquemines wildcat drills below 11,670 feet; Scott-Duson prospect wildcat testing; new producing sand discovered at Avery Island.

Beauregard Parish: The Atlantic Refining Company's Newport Industries Company 1, wildcat 2 miles northwest of West Pine Grove production in 11-5s-12w, has discovered a new Cockfield producing area. Total depth is 7346 feet with 7-inch casing set to 7339 feet and perforated for completion at 7272-78 feet. Initially the well flowed 113½ barrels of 40-gravity oil daily through 6/64-inch choke with 1040 pounds flowing pressure on tubing, casing sealed, and gas-oil ratio 513/1.

Plaquemines Parish: The California Company's E. P. Brady 9 has been completed in a new producing sand at Alliance field. On potential the well flowed 89 barrels of 38.1-gravity oil daily through 6/64-inch choke with 975 pounds tubing pressure and gas-oil ratio 551/1. Total depth is 9750 feet with 7-inch casing set to 9430 feet and perforated at 9252-57 feet for completion. This well is in 19-16s-24e, approximately 1000 feet northeast of the Brady 4 discovery.

Sid W. Richardson's Delacroix Corporation 1-A, wildcat 3 miles west of Delacroix field and in 1-16s-13e, is drilling below 11,670 feet. Electric logs run approximately to total depth have indicated no shows.

Lafayette Parish: Sohio Petroleum Company et al's Harson Unit "A" 1, wildcat on the Scott-Duson prospect 11 miles east of Crowley field and in 5-10s-3w, was making production tests. Latest test at 10,750-52 feet recovered 100 percent salt water. A previous test at 10,840-56 feet flowed gas and condensate with 3500 pounds working pressure.

Iberia Parish: Humble Oil & Refining Company's Petit Anse Company 13-B waited on potential after being completed in a new producing sand at Avery Island field. On initial gauge the well flowed 324 barrels of 35-gravity oil daily along with 262,000 cubic feet of gas. Total depth is 10,795 feet with 7-inch casing set to 10,700 feet and perforated in the new pay sand at 10,310-60 feet for completion.

Petroleum Statistics Booklet Soon Off Press

The 1947 edition of "Twentieth Century Petroleum Statistics," published by DeGolyer and MacNaughton, will be ready for distribution by the end of May. The booklet was originally started in the office of the Director of Naval Petroleum Reserves during the war.

It contains 62 pages of statistics together with 62 charts and is completely indexed. Approximately 250 tables of statistics are included, covering all phases of the industry from 1900 to date in many instances, and from 1918 to date in every instance.

Price of the publication is $7.50 and inquiries may be addressed to DeGolyer and MacNaughton, Continental Building, Dallas.

England was a Piker!

Every leftist in America should be required to review his early American history while spending a few days of meditation in the vicinity of restored Williamsburg and the ruins of Jamestown. He should be required to sit down in the peaceful old home where Cornwallis surrendered to George Washington, occupied at that time by BROWN—and built by SMITH. George and the boys had won a battle against taxation, domination and red tape. It is just as well they did not suspect that England was a piker—that the cost of self-government would one day reach 30 per cent of the national income and that labor unions in our own midst would impose taxation without representation.

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• North Louisiana

Bienville Parish Discovery Is Completed as Gas Well

Lion Oil discovers gas near Bryceland; Conway area wildcat to make production test; new gasser for Monroe field.

Bienville Parish: Lion Oil Company's L. E. Ozley 1 discovery, 3 miles east of Bryceland in C SW NE 13-17n-6w, was finally completed as a gas well with initial production on open flow estimated at 1 million cubic feet of gas per day. Extended efforts by the operator made this well a gasser after many squeeze and reperforating jobs, several acidizing operations and three plug-backs. With total depth at 10,744 feet, a strong blow of gas came in and production tests below 10,700 feet failed, so the well was plugged to 10,158 feet. Additional tests near the 10,000-foot zone after acidizing were also negative, and the well plugged to 9600 feet. Failure to get production between 9000-300 feet resulted in the third and last plug-back to 8000 feet. Final perforations were made at 7696-736 feet with 216 shots and the well washed in. Casing program included 13⅜-inch to 310 feet, 9⅝-inch to 3045 feet and 5½-inch to 10,740 feet. The Travis Peak was topped at 7125 feet.

Union Parish: The Monzingo-Rivers Lumber Company 1, wildcat 5 miles west of Conway, was drilled to total depth of 3520 feet. The operators, R. T. Sellars, Wilson Ewing and Gus Primos, will test the Nacatoch sand, reportedly topped at 2135 feet. Casing has been run, but setting depth was not disclosed. A drill-stem test in the Nacatoch at 2130-52 feet recovered some oil-cut mud.

Ouachita Parish: Union Producing Company's No. 152 Fee 1, 4-18n-4e, deep test in the southern section of the Monroe gas field, was drilling out cement preparatory to perforating for production test in the Rodessa horizon. It is believed this well will make a good gasser. With total depth at 4106 feet, 7-inch casing was cemented to 3237 feet.

Field to Be Unitized

An agreement on a program to unitize the entire structure of the North Burbank field of Osage County, Okla., has been agreed upon by operators in the field, and approval has been given by the Osage Indian Council. At the present time about 80 percent of the structure is being subjected to gas repressuring—or 17,500 acres of the 22,700 acres. The entire South Burbank field has been operated as a unit for nearly ten years.

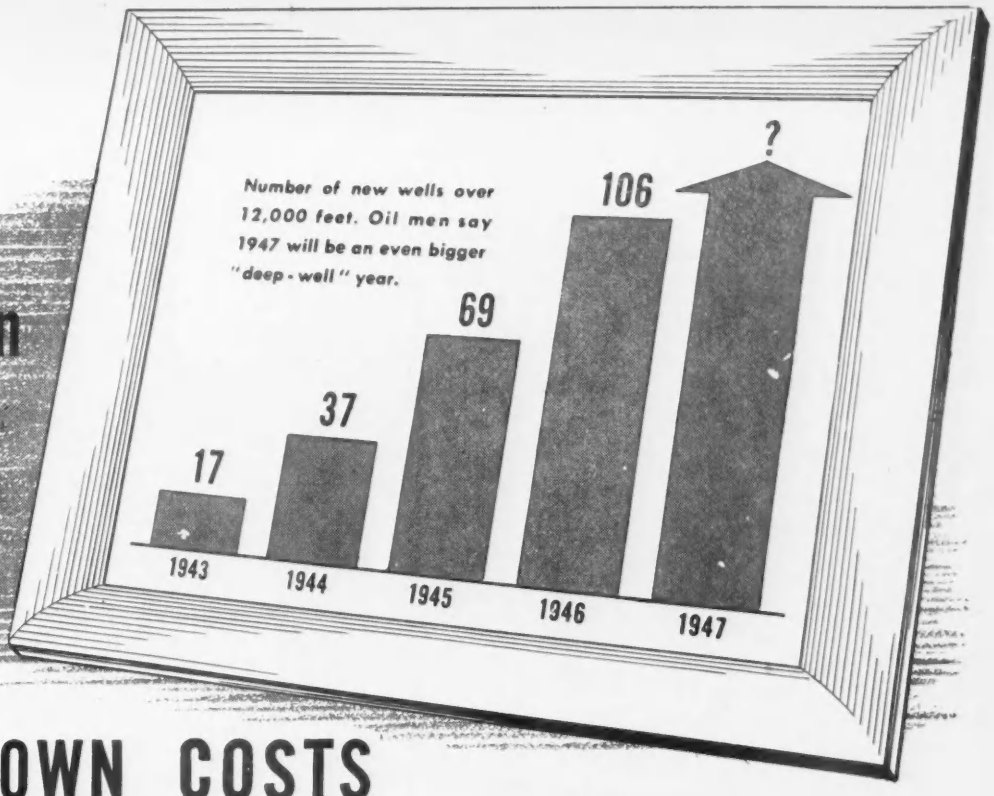
• Arkansas

Wildcat in Urbana Field Is Indicated Discovery

Wildcat testing oil in Union County; Wesson field gets 2 good producers.

Union County: J. L. Perry, Trustee's wildcat Callie Dupe 1, NE NW 13-18s-13w, is an indicated oil discovery 3 miles northeast of Urbana field near Sandy Bend. On test the well flowed 100 barrels per day, 15 percent 28-gravity oil and 85 percent salt water. Operators were squeezing to eleminate formation

Here's the picture on deep-well drilling...



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water. Test was made of perforations from 2888-92 feet. Total depth is 3503 feet.

Ouachita County: Two good wells were completed in the Wesson field: Lyons & Prentiss' Linkous 2, C NW NE NE 23-15s-19w, flowed 250 barrels of oil daily through 16/64-inch choke from Rodessa perforations at 2460-65 feet; and McAlester Fuel Company's A. C. Wesson B-1, C NE NE NE 26-15s-19w, pumped 230 barrels daily from a lenticular sand below the James lime in the Rodessa formation at 3074-3118 feet.

Lafayette County: McAlester Fuel Company's wildcat C. Lee A-1, C SW NW 24-17s-24w, is below 8002 feet. Cotton Valley was topped at 6523 feet.

• Mississippi

Marion County Test in Hub Field Area Is Encouraging

Marion County test looks encouraging; Jefferson County test fails.

Marion County: Humble Oil & Refining Company's C. Tullos 1, SWc 12-1n-18w, several miles south of the Hub field and west of Baxterville, was setting production string after running electrical log to 10,990 feet. Tests will be made of shows developed earlier in the Tuscaloosa section at 9027-37 and 9037-44 feet. Shows which tested out from cores revealed stain and odor in porous sand stringers of no considerable thickness and a subsequent drill-stem test of the section recovered only mud and salt water with traces of oil. Structure is running much lower than either of the 2 fields in the vicinity, both of which produce from reservoirs in the Tuscaloosa. Top of porosity in the Hub field is 8930 feet and that of Baxterville is 8477 feet. Humble's Ernest R. Ford 1, SEc 20-1n-17w, Tuscaloosa test, reached 2625 feet and was setting protective string. The well will go to 10,000 feet. A third wildcat in the area is S. W. Richardson's Pearl Randall 1, SE SE 18-5n-17w, drilling below 4034 feet with no shows reported.

Jones County: Gulf Refining Company's L. L. Majors 1, SEc NE 29-6n-11w, wildcat which has shown excellent indications of commercial production in the Eutaw and Tuscaloosa sections, continued with core tests below 11,876 feet. Cores at 11,836-75 feet recovered asphalt sandstone with shale streaks, while those at 11,870-75 feet developed sandy shale. No shows have been noted below 11,597 feet.

Jefferson County: The Ohio Oil Company's Hard Times Plantation 1, NEc 35-8n-1w, has been abandoned as a duster at 10,222 feet. The Plantation, which is located midway between the Cranfield and Fayette fields, encountered slight odor and stain in the Wilcox zone at 3811-21 feet but no shows whatever were developed in the Lower Tuscaloosa and Massive sand zone.

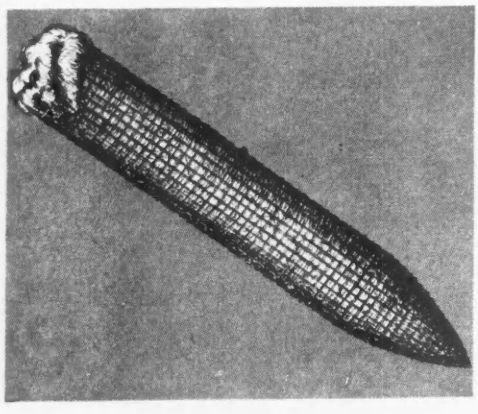
Warren County: Amarada Petroleum Corporation's Dabney-Bonelli 1, SWc 9-18n-2e, Tuscaloosa test on the flanks of the Sharkey platform, encountered slight shows of oil in the Wilcox zone. Shows were recovered in cores at 3311-13 and 3612-17 feet. Shows in past tests in the county have not been uncommon, but usually have occurred as small traps with no commercial significance. Developed so far is only the Kings field, about 14 miles southeast of the Dabney Bonelli where Magnolia Petroleum Company brought in a couple of gassers last year. Production in Kings is from several sands above 2500 feet. The Dabney-Bonelli is now below 4112 feet in igneous rock.

Madison County: Gulf Refining Company's J. R. Fancher 1, NWc SW NW 25-10n-4e, wildcat, was waiting on orders at 6460 feet. With Tuscaloosa top indicated at 5628 feet, cores at 6200-357 feet recovered ashy sand and shale with considerable salt water. No shows have been noted at any point along the hole.

Adams County: Texas-Pacific Coal & Oil Company's O. L. Wilson 3, 8-6n-2w, LaGrange field, was preparing to complete after running tubing. The well had previously indicated a new pay zone for the Wilcox section after porous gas sand was established at 4617 feet, but the well is being completed from the conventional producing zone between 6248-59 feet and on drill-stem test flowed at the rate of 144 barrels of 43.6-gravity oil per day.

Florida

Humble Oil & Refining Company's Lee Cypress Company 3, SE SE 28-47s-29e, Collier County, was working on the hole after reaching 11,943 feet. A drill-stem test at 11,865-91 feet recovered only mud, although a previous test up the hole had recovered oil-cut mud and oil cut with acid water. Cores at 11,891-941 feet recovered shows of oil in streaks. Humble's Gulf Coast Realty 9, C SE/4 24-48s-29e, Sunniland field, installed pump and was running tests



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after production was established at 11,566-70 feet.

Palm Beach County: Humble's Tuscon Corporation 1, SWc 35-43s-40e, was running core tests below 10,630 feet. No shows have been indicated.

Marion County: Sun Oil Company's Henry N. Camp 1, SW NE 16-16s-23e, is drilling below 4100 feet with no shows reported.

Alachua County: Tide Water Associated Oil Company's Josie Parker 1, NW SE 33-7s-19e, rank wildcat, has been abandoned in quartzite and hard shale at 3219 feet. No shows were reported.

Alabama

Considerable interest has been focused on Glen D. Roses' First National Bank of Birmingham 2 and 3, wildcats in Walker and Winston counties, respectively. The No. 2 test, NW SE 30-12s-17s, was drilled to 3220 feet and is being prepared for production tests. Casing was perforated at 1240-45, 1640-45 and 1785-90 feet, and acidized with 3000 gallons. The No. 3 test in Winston County, SW SE 7-12s-8w, was drilled to 2005 feet and had showings of gas at 1384-94 and 1440-45 feet in the lower Banger lime, topped at 1025 feet. The well was perforated with 30 shots at 1384-89 feet and 30 shots at 1442-47 feet just above the Hartselle sand and treated with 1000 gallons of acid. Packers were set above and below the two perforated zones and reports on the tests indicate that the lower packed failed, resulting in a recovery of 19-gravity, heavy, black oil.

Georgia

T. R. Davis' Bonny Brown 1, Toombs County, was preparing to set surface casing after reaching total depth of 276 feet. The test is in an unsurveyed area about 7 miles east of Lyons in the eastern section of the state.

Expansion Planned

General Petroleum Corporation has announced plans for expansion of its Harbor Island Terminal facilities in Seattle. During the next three years a total of $2 million is to be spent for enlarging of the Harbor Island Bulk petroleum plant.

• Michigan

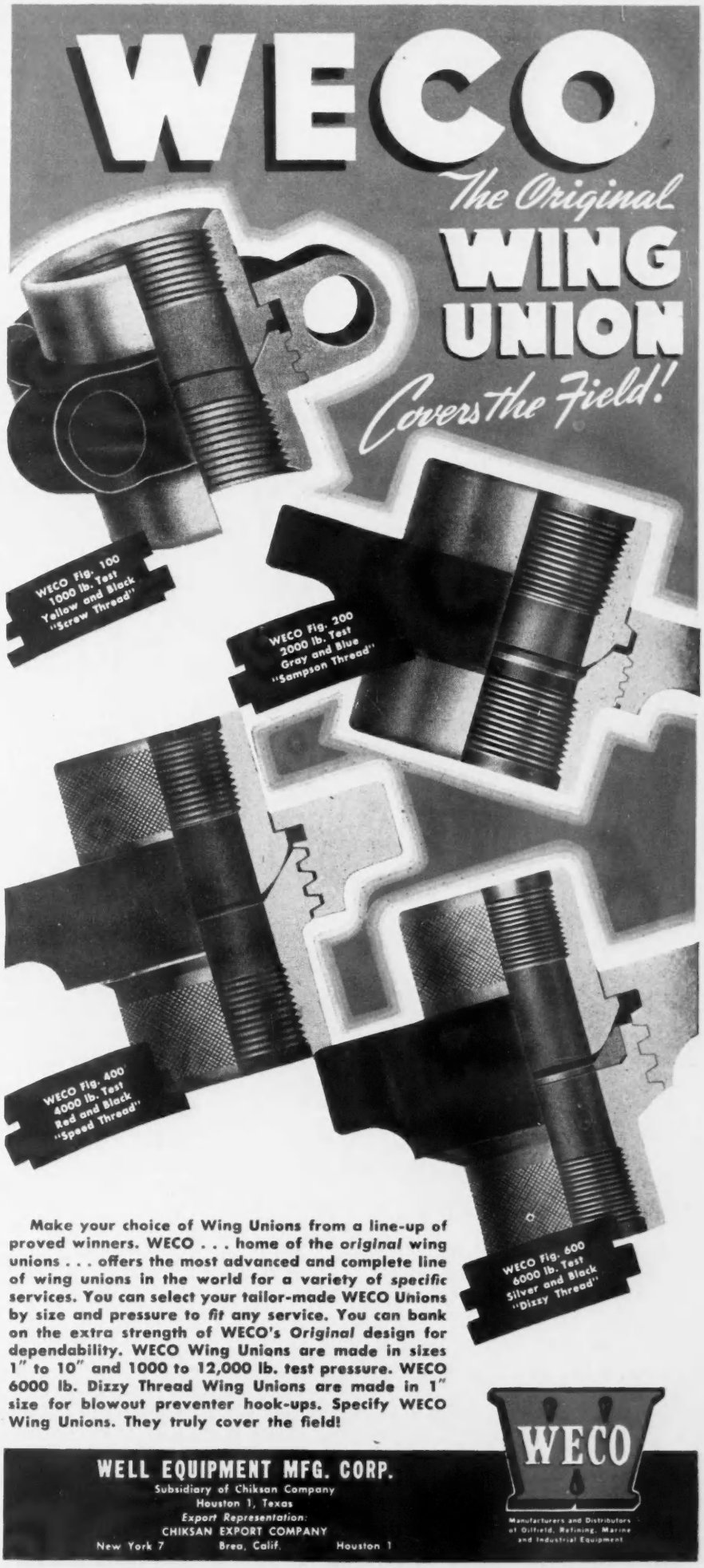
Three Discoveries Recorded; Bay County Well Declines

Two oil discoveries and a gas discovery credited to exploratory operations but none of the 3 areas offers immediate prospects of extensive drilling.

Bay County: McClanahan and Reese's Knoodle 1, SE SE SE 13-17n-3e, Mt. Forest Township, after flowing 77 barrels net in 8 hours after acid from Dundee pay at 3030 feet, was reported settled back to about 50 barrels a day and still declining.

Midland County: Collin and Whitney's O'Dell 1, S½ SE NW 7-15n-1w, was pumping 20 to 30 barrels of oil daily from Dundee lime pay at 3772 feet.

Roscommon County: Sun Oil Company completed State 1, C NE SE 24-24n-1w, 3 miles east of old Richfield pool, for 1 million cubic feet of gas after acid to Richfield pay section bottomed at 4278 feet.



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• Illinois Basin

Illinois Has Six Discoveries; Indiana, Kentucky One Each

Six discoveries reported in Illinois; Indiana and Kentucky have one each.

Illinois

Evans and Barlow's Stanley 1, NW NW NE 35-5n-7e, Clay County, ¾ mile north of the North Hoosier pool, is a McClosky lime discovery. After 2500 gallons of acid the well began swabbing 8 barrels of oil per hour from pay at 2945-50 feet.

Edwards County: Inland Producers' Harms 1, SE SE NE 19-1s-14w, 2 miles northeast of Albion production, recovered 2000 feet of oil on a drill-stem test of Cypress sand at 2710-20 feet to open a new area. Operator was drilling ahead for a view of lower pays.

Effingham County: The Superior Oil Company's Kluthe 1, NE SW SE 10-6n-7e, has given the North Bible Grove pool a new pay horizon. The well yielded 1 barrel of oil per hour natural from Cypress sand at 2535-40 feet. McClosky lime pay at 2880-85 feet also showed 1 barrel of oil per hour natural and will be treated with 3000 gallons of acid.

Edwards County: Magnolia Petroleum Company's Wilson 1, NE NE SW 18-1s-10e, 2 miles south of the Massilon pool, yielded 2 barrels of oil per hour natural from O'Hara lime at 3315-25 feet. Operators plan to acidize the well.

White County: Joe Reznik's Grant 1, SW SW SE 13-7s-9e, has pipe set to Tar Springs sand at 2290-300 feet. On a drill-stem test the well showed 2000 feet of oil in 1 hour. The well is a discovery 1½ miles east of the Herald pool.

Gallatin County: R. B. Martin and associates' Davis 1, NE NE SW 1-8s-8e, a wildcat which showed prospects of production in Tar Springs sand when plug was drilled, has been abandoned as dry at 2125 feet.

Richland County: Central Pipe Line Company's Harrell-Hunley, NW NE NW 34-5n-9e, 4 miles west of Olney, was showing for production in a new pay zone for the area. Operators were preparing to test shows in McClosky lime at 2926-38 feet which gassed in 2 minutes and flowed oil in 8 minutes during a drill-stem test.

Indiana

The Texas Company's Golden 1, NE NW SE 19-5s-13w, Posey County, ¾ mile east of the Springfield pool, swabbed 70 barrels of oil in 24 hours natural from Waltersburg sand at 2115-25 feet.

Kentucky

Sun Oil Company's Williams 1, 24-R-20, Henderson County, has pipe set for test of Waltersburg sand at 1855-60 feet. A mile north of the Grassy Pond pool, the well yielded oil during a drill-stem test.

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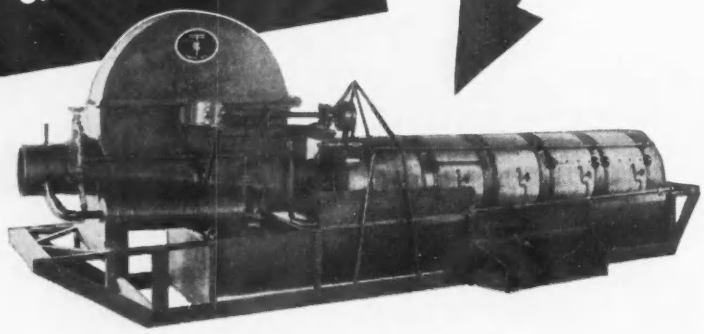

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An executive committee of seven members with full power to act for the Executive Board of the American Gas Association between regular meetings has been appointed as follows: President, R. H. Hargrove, vice president, United Gas Pipe Line Company, Shreveport; the vice presidents Hudson W. Reed, president, The Philadelphia Gas Works Company, Philadelphia and Robert W. Hendee, president, Colorado Interstate Gas Company, Colorado Springs; immediate past president, Everett J. Boothby, vice president and general manager, Washington Gas Light Company, Washington, D. C.; Lyle C. Harvey, president, Bryant Heater Company, Cleveland, representing the manufacturers; George F. Mitchell, president, The Peoples Gas Light and Coke Company, Chicago; and E. H. Eacker, vice-president, Boston Consolidated Gas Company.

• Ohio

Medina Well Is Extensioner For Pleasant Township Area

Pleasant township has Medina sand well; Clinton extension made at Salt Creek; large well extends Symmes.

Perry County: Altier Brothers drilled in Elizabeth Street 1, NE SE 28, Pleasant township, with 1,160,000 cubic feet of gas in the Medina sand. The Clinton had only a show of gas at 24 feet in and the well was drilled down and reached the Medina at 3893 feet. Drilling was stopped at 3898 feet while still in the sand. The well extends the pool ½ mile south and will cause additional drilling.

Muskingum County: Wasson Company's O. R. Downing 1, NW SE 36, Salt Creek township, was completed after having had the rig burn down when in the top of the sand. Clinton sand, topped at 4439, was drilled to 4465

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feet, where the drilling was stopped while still in sand, and the well tubed. Pay was continuous and the final gauge was 4,257,000 cubic feet.

The Salem Petroleum Products, Inc.'s C. W. Tipton 1, NE NW 15, Brush Creek township, was drilled through a thick bed of Clinton at 3803-54 feet, but the open flow was small at 280,000 cubic feet, natural. The well was shot with 40 quarts and when shut in had a gauge of 500,000 cubic feet.

Lawrence County: The sand is thickening to the west in the Symmes pool, and the second largest open flow well in the pool was completed by Ohio Fuel Gas Company on S. S. Willis, SE NW 13, Decatur township. The Clinton sand came in at 3059-79 feet with a natural flow of 3,700,000 cubic feet.

• Rocky Mountain Area

Meridian Anticline Wildcat Begun in Southwest Wyoming

Wildcat started on Meridian Anticline of southwestern Wyoming; Natrona County wildcat is failure in Frontier; Niobrara County test cores good saturation in Leo sand; Church Buttes field test makes drill-stem test in Dakota; deep test located on Barker Creek structure, La Plata County, Colorado; Carbon County, Montana, test has good recovery from Second Frontier.

Wyoming

An interesting wildcat on the Meridian Anticline of southwestern Wyoming is being started by Union Oil Company of California and The Carter Oil Company on the Little Round Mountain Unit. The well is Government 1, C NW NE 30-20n-115w, Lincoln County, 10 miles southeast of Kemmerer. The test is to 4000 feet and probably will test the Thaynes (Triassic) formation at that depth. The structure is highly faulted and folded.

Natrona County: The British American Oil Producing Company wildcat test of the Natrona Unit, north of Casper, is a failure in the Frontier formation and does not look too encouraging at its present drilling depth of 4832 feet. The well is Unit 1, NE NE SW 27-36n-83w, and topped the Third Frontier at 3641 feet but found that formation hard and dry. Sundance is expected by 5000 feet, and the well will not be carried deeper if that horizon has no shows. The Frontier and Sundance formations have been large producers in the Salt Creek field, 50 miles north of Natrona.

Niobrara County: At Saddle Horse, south of the Old Woman Creek structure and 20 miles east of the Lance Creek field, M. Seigel and others' test at Government 1, SE SW SE 20-36n-62w, was reported to have cored good saturation in the Leo (Minnelusa) sand. The well is at 1943 feet, total depth, and topped the Leo at 1870 feet. Casing has been run to the top of the sand and the well will be tested in this zone.

Uinta County: Mountain Fuel Supply Company of Rock Springs, Wyo., has released information of a short drill-stem test of the upper section of the Dakota sand in Unit 3, NE SW NE 12-16n-113w, Church Buttes field, southwestern Wyoming. The well flowed at the rate of 12,800,000 cubic feet of gas daily on 20-minute test at 12,945-52 feet. Operator plans to carry this well to approximately 13,275 feet before completion. Dakota is the producing formation in the discovery test, a mile east of Unit 3. No geological information has been released on this well, or on Unit 2, 6 miles northeast of Unit 3, which is at 12,458 feet, total depth, also reported in the Dakota sand.

Washakie County: At Hidden Dome, MacKinnie Oil & Drilling Company's extension test a mile northwest of the Tensleep sand discovery well is drilling below 4670 feet, still in the Chugwater formation. The well, Broome 1, SW SW SW 30-48n-90w, is running more than 500 feet lower structurally than The Ohio Oil Company discovery, and if productive will considerably enlarge the producing area of the field. Ohio is drilling below 1889 feet on Well 3, Tp OPC 2, a location west of the discovery well, and has made location for No. 4 Tp OPC 2, midway between the discovery and the MacKinnie test.

Colorado

Southern Union Producing Company has made location for a deep test on the Barker Creek structure on the Colorado side of the field, La Plata County and 1½ miles northwest of nearest production in the field. This well is on acreage acquired by Southern Union at an Indian lease sale several months ago. Southern Union now has 5 Pennsylvanian formation gas wells at depths around 9000 feet, and its recent completion at No. 18 had an initial of 60 million cubic feet of gas daily open flow. The new well is Barker 19, C NW¼ 3-32n-14w.

Moffat County: Rainbow Drilling

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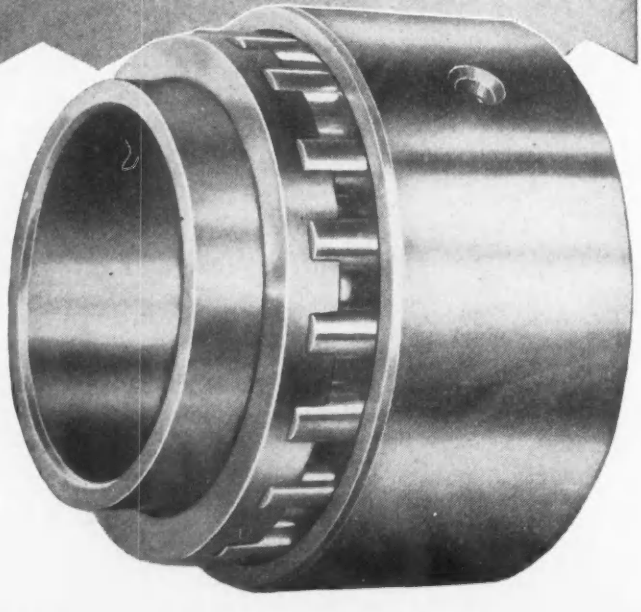

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Company has announced location for a wildcat in the South Skull Creek area, 12 miles north of Rangely field. The well is Goff 1, C NW SE 2-3n-101w, and is on a block acquired by independent operators of Denver. The new test is 4 miles south of a well being drilled by Richfield Oil Corporation of Montana at Fee 1, SE SE SE 15-4n-101w, on the Skull Creek structure. The Richfield well was preparing to resume operations at 1500 feet, total depth, after being shut down for the winter.

Montana

Sinclair Wyoming Oil Company has had good recovery on a drill-stem test of the Second Frontier sand on its wildcat test of a new high at Northwest Elk Basin, Carbon County. The well is Wilkins 1, NW SW NW 28-9s-23e, a mile northwest of production in the Elk Basin field. In 1 hour the well made 315 barrels of oil, 285 feet of oil-cut mud, and an estimated 77,000 cubic feet of gas between 3425-76 feet. On another drill-stem test at 3611-42 feet the recovery was only 45 feet of mud. The well will be drilled to Tensleep at around 5000 feet.

Cities Service Observance

"Founder's Day" was observed May 15 by employes of Cities Service Oil Company and Empire Pipe Line Company. A. W. Ambrose, Cities Service president, told 350 employes at Bartlesville, Okla., that operations of the companies are at a peak at present, and that the company expects its oil and gas production in 1947 to materially exceed that of recent years.

• California

Wildcat Near Orcutt Field Is Indicated Discovery

Wildcat southeast of Orcutt field in Santa Barbara County looks like discovery; State Lands Commission asks for bids on tidelands piece in Ventura County due to threat of drainage; schist test will be drilled in old Lawndale field in Los Angeles County; Long Beach deep test has oil and gas showings; Bacon Hills discovery well makes 55 barrels in 9 hours on pump; dry holes indicate new Fresno County discovery may be of minor importance.

Santa Barbara County: Favorable formation tests during the last week of Sunray Oil Corporation's Los Flores 1 wildcat a mile southeast of the Orcutt field in 4-8n-33w indicate the probability of a discovery from a Miocene sand not present in the Orcutt field. On a formation test of the interval 4400-500 feet there was a strong gas blow and recovery was drilling mud with 10 percent free oil testing more than 30 gravity. On a second test of the interval 4800-40 feet, the packer failed after 1½ minutes. With a 500-foot water cushion, however, there was a 600-foot rise of mud and 33.3-gravity oil. Bottom hole pressure was 2200 pounds. Operator reamed the hole and was setting 8⅝-inch casing on bottom at 5658 feet and will cement through perforations at the top of the chert zone at 5270 feet.

About 3 miles northeast of the Elwood field. The Ohio Oil Company staked a wildcat, Thomas B. Bishop Company 1, projected 7-4n-28w. Last year, Ohio

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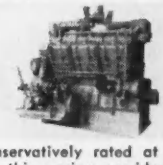

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■ SECONDARY-RECOVERY ENGINEER—B. S. degree in petroleum production engineering; eight years active experience Oklahoma and Texas water-flood, repressuring, and pressure-maintenance operations; Core-analysis laboratory procedure and interpretation; reservoir analyses in connection with secondary-recovery development; preparation of statistical and technical reports for publication; considerable experience general production engineering; bottom-hole pressure, well productivity, gas measurement testing. Box 42, c/o The Oil Weekly, Houston, Texas.

■ MECHANICAL ENGINEER, 20 years experience with oil trade in designing and sales, desires to make connection with reputable manufacturing concern. Hold patents to keep company busy on saleable items. Address Box 50, c/o The Oil Weekly, Houston, Texas.

■ Geologist—B.S. degree; four and a half years experience in subsurface work, scouting, and sitting on wells, desires employment, preferably in Rocky Mountains. Would consider foreign. Address: Box 52, c/o The Oil Weekly, Houston, Texas.

HELP WANTED

■ SALT WATER DISPOSAL ENGINEER, experienced. Major oil company, Oklahoma City. Prefer engineer with three years oil production and salt water disposal experience. Give full particulars, reply P. O. Box 48, The Oil Weekly, Houston, Texas.

drilled Previedello 1 in 1-4n-28w to 3266 feet. This well had slight oil and gas showings.

Ventura County: The California State Lands Commission has asked for bids on a 1920-acre tidelands piece offshore from the mouth of the Santa Clara River. This location is a short distance west of Standard Oil Company of California's recent important discovery on the Oxnard Plain. The state law requires that the tidelands be drilled when there is any threat of drainage. Under no other circumstances can the tidelands be drilled as the law now reads. Bids will be opened at the state building in Los Angeles July 1. Standard is drilling McGrath 65-3 in 30-2n-22w ½-mile southeast of its discovery well and has made location for Maxwell 1 in 23-2n-22w about 1 mile northwest of the discovery. This is the well on which the state bases the threat of drainage as it is only several hundred feet from the tidelands.

Los Angeles County: Seaboard Oil Company has staked Johnson 1, a Schist conglomerate test in the nearly dormant Lawndale field. This field, discovered in 1928, was a townlot drilling fluke. Sixty-four wells were drilled and only 7 confined to an area of less than 25 acres, were small producers. None of the wells, however, was drilled to the schist. There is schist production in the El Segundo field, 2 miles northwest.

In the Torrance field, where several schist tests have been drilled without success, R. W. Jerman's Torrance 1 was coring in schist below 5757 feet. No showings have been reported.

Shell Oil Company's deep test, Dolley 1, on the north flank of the Long Beach field was reported to have had oil and gas showings when tester was run after setting 7-inch casing at 10,030 feet. Operator denied the development was of any importance and was preparing to drill below 10,150 feet.

Orange County: California Exploration Company has spudded Cagney 1, a wildcat north of the West Newport field.

Calumet Gold Mines Company, which is planning to drill 15 to 25 wells to the shallow Tar Zone in the townlot area of the Huntington Beach field, is completing its third well. The first producer is pumping 12 barrels of 12.5-gravity oil, 50 percent cut. Second well is on the pump with no estimate available. Depth of the wells is about 1875 feet. Present prices for heavy oil are said to justify the development.

Morton and Kohlbush have built rig for Townlot 1, an exploratory test near the intersection of Acasia and 22nd streets.

Kern County: Seaboard Oil Company's Bacon Hills discovery well, Seaboard Bandini 3 in 21-28s-20e, is on the pump for a tour a day and was making 55 barrels of 40-gravity oil in 9 hours. A second well has been spudded on a stepout location and its outcome will go far toward determining the importance of the discovery. Two miles southwest of the discovery, Independent Exploration Company has staked location for Anderson 1, a wildcat.

Belridge Oil Company was winding up operations on its South Belridge deep test, 62w-33 in 33-28s-21e, spudded almost 2 years ago. It is understood another test will be made above 5800 feet and that will wind it up.

Universal Consolidated Oil Company has staked Lost Hills 18, an exploratory test for shallow production in the west flank of the Lost Hills field in 30-26s-21e.

Fresno County: Sharples Corporation's Northeast Coalinga extension discovery, Hyde 1 in 6-19s-16e, was being placed on the pump after flowing by heads at a 150-barrel rate.

A further indication that the Superior Oil Company's recent discovery near the town of San Joaquin will embrace only a small area was Union Oil Company's abandonment of Waechter 44-32 in 32-15s-17e, northeast of the discovery, which quit at 7173 feet. Superior 2 weeks ago abandoned Hackala 75, east of the discovery at 7242 feet, indicating that the productive area must lie west of the discovery well.

HELP WANTED

GEOPHYSICISTS

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WANTED — Experienced geophysicists, computers, and recorders by an expanding contract seismograph company in marine exploration. All inquiries held confidential.

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Leduc Successes Establish Production on 3¼-Mile Line

Imperial Oil Ltd.'s Leduc 3 filled 5300 feet of 4½-inch drill pipe in 1 hour May 1 and began flowing 36.4-gravity crude. The success followed by a week the discovery at Imperial 2 of a new oil- and gas-bearing Devonian dolomite zone about 200 feet below the zone discovered in mid-February at Imperial's No. 1. The 3 successes have established production along a 3¼-miles southwest-northeast line, running from the No. 2 well (1¼ miles south and west of No. 1) to No. 3 well (2 miles northeast of No. 1). Width to the line may be added by Imperial 4, a mile southwest of No. 1, and drilling close to production depth.

Imperial 1, lsd 5 22-50-26w4th, got its production about 500 feet in the Devonian between 5029-66 feet (casing off over 30 feet of slight porosity immediately above). The Nos. 2 and 3 wells found this "No. 1 zone" oil and gas-bearing but with porosity poorly developed. At 5375 feet, No. 2 broke into its discovery zone (now called the "No. 2 zone"), and got gas flows ranging from 1000 to 1500 Mcf in a series of drill-stem tests to 5413 feet, with 38.8-gravity oil reaching the surface in from 5 to 12 minutes, flowing by heads for duration of tests. A test at 5413-23 feet gave a smaller gas volume, with fluid reaching surface in 18 minutes. When pipe was pulled, it was found to contain 900 feet of oil and 1020 feet of salt water, establishing the water line in the No. 2 zone. (This well plugged back to 5410 feet, set 5½-inch casing to that depth, and was gun-perforating opposite the oil zone on May 19.)

No. 3 well, located up-dip from Nos. 1 and 2, broke into the No. 2 zone at 5178 feet. Drill-stem tests at intervals down to 5292 feet gave gas flows ranging up to 2750 Mcf, plus small shows of light oil. A test at 5297-313 feet, made after penetrating a total of 135 feet of varying porosity in the No. 2 zone without reaching its base, gave a gas flow starting at rate 485 Mcf, declining to zero in 1 hour, at which time oil reached surface and well commenced flowing oil by heads. When pipe was pulled, fluid level was found 2800 feet up from the base of the pipe. Oil tested 36.4-gravity, with no sign of water. Seven-inch casing has been set to 5297 feet, shutting off the gas-bearing section of the No. 2 zone. Plug was to be drilled and the well placed on production.

New locations for the rigs from Nos. 2 and 3 wells will be staked by Imperial immediately. Meanwhile, it has 2 other rigs drilling on Nos. 4 and 5 wells. Independents have let contracts for 3 wells, stepping out from 1 to 3 miles from the area now proven, and will get drilling under way this month.

Five rigs have started work on wildcats in the virgin region limelighted by the Leduc discovery. McColl-Frontenac has started wildcats 30 miles southeast, 24 miles south and 18 miles southwest of the Leduc strike, while Imperial has started in 40 miles north and 35 miles southwest of the discovery.

These new wildcats are: McColl-Frontenac 3-22-46-23, lsd 3 22-46-23w4th (East Wetaskiwin); McColl - Frontenac 1 20-46-26, lsd 1 20-46-26w4th (Bigstone Creek); McColl-Frontenac 14-14-48-27, lsd 14 14-48-27w4th (Wizard Lake); Imperial-Morrinville 1, lsd 9 30-56-24w4th; Imperial-Battle Lake 1, lsd 16 12-46-3w5th.

May also has brought an expansion of geological and geophysical operations in this virgin region, where upwards of 9 million acres are under reserve in a belt 300 miles long and up to 100 miles wide. Imperial Oil is working 4 seismographs. McColl-Frontenac has expanded its seismic parties from 1 to 3. Gulf Research & Development Company has moved in a second seismic party, and is starting an aerial magnetometer this month. Standard Oil Company of California, getting into the south swing of the play, has started a seismograph party to work, in addition to several core-drill parties.

The Lloydminster-Lone Rock "heavy crude" (14 to 18 gravity) area, straddling the Alberta-Saskatchewan border, is making rapid progress on its "100 well minimum" 1947 drilling program. By May 10, completions totalled 32, including 5 in January, 2 in February, 6 in March, 14 in April and 5 between May 1 and May 10. Completions during May and subsequent months are expected to range between 15 and 20 in number.

The wells are spaced along the 30-mile long area opened up by a string of widely spaced wildcat successes drilled in 1946. Wells range in depth from 1750 to 2000 feet. Average potential for wells placed on pump so far this year is about 75 barrels daily. Several, however, range over the 100-barrel mark.

EXPLORATORY FAILURES

ARKANSAS WILDCATS

Ashley County: McAlester Fuel Co.'s Crossett Lbr. Co. A-1, c ne se 28-15s-6w, Nacatoch 3313, abnd 5-11-47 at 3810.

Clark County: W. H. Littlejohn's Suitor 1, 350 fr sl 2640 fr el 3-8s-18w, abnd 5-5-47 at 1054.

Drew County: Curtis Kinard's A. S. Reinhart 1, c nw se sw 15-12s-6w, Gas Rock 3534, Nacatoch 3669, Eagle Mills 4300, abnd 5-9-47 at 4523.

CALIFORNIA WILDCATS

Fresno County: Union Oil Co.'s Waechter 44-32, 32-15s-17e, San Joaquin area, abnd 5-16-47 at 7173.

Kern County: Cal Oil and Gas Co.'s Cal 1, 25-29s-20e, Temblor area, abnd 5-8-47 at 3246.

Miller and York's Merritt 1, 29-29s-21e, Cymric area, Brown Shale 1320, Valv 2480, Media Shale 3250-3300, Carneros streaks 3395-3495, L. Santos 4450, Phacoides 4933, abnd 5-13-47 at 5005.

COLORADO OUTPOST

Rio Blanco County—Rangely: Delta Drlg.-Mountain States' Kenney 1, sw nw sw 34-2n-101w, Morrison 4425, Shinarump 5991, Moenkopi 6079, Weber 6717, abnd 5-7-47 at 6746.

FLORIDA WILDCAT

Alachua County: Tide Water Associated Oil Co.'s Josie Parker 1, nw se abnd 5-1-47 at 3219.

ILLINOIS WILDCATS

Cumberland County: Joe Reznick's Butler 1, nw sw ne 20-9n-9e, abnd 2658.

Hamilton County: Sohio Petroleum Co.'s Stocke 1, nw se nw 12-4s-7e, abnd 3499.

Jasper County: T. R. Buell et al's Lambird 1, nw sw ne 14-6n-8e, abnd 3211.

Jefferson County: Ashland Oil & Refining Co.'s Pollock 1, se nw se 31-1s-2e, abnd 2346.

Macon County: G. G. (Betsy) Davis' Clements 1, 28-17n-3e, abnd 2344.

White County: Ashland Oil & Refining Co. et al's Phipps 1, nw sw sw 8-7s-8e, abnd 3169.

INDIANA WILDCATS

Gibson County: Messmer & Dickerson et al's Howard 1, sw sw ne 35-1s-11w, abnd 2170.

C. E. Skiles' Turner 1, ne ne sw 3-2s-12w, abnd 2310.

Milton Lobree et al's Vieke 1, ne sw 8-2n-10w, abnd 1936.

Knox County: N. A. Cummings et al's Deem 1, 36-2n-10w, abnd 2203.

Sullivan County: J. L. Black's Kennett 1, nw ne sw 20-8n-10w, abnd 2780.

S. R. Travis' Pigg 1, sw ne sw 29-8n-10w, abnd 951.

Washington County: Washington County Development Co.'s Elrod 1, se sw 8-2n-4e, abnd 1840.

KANSAS WILDCATS

Barton County: Jones & Shelburne's Jenisch 1, nw nw ne 11-17s-12w, abnd 3406.

Graham County: Derby Oil Co. et al's Cox 1, se se nw 33-9s-21w, abnd 4018.

Stafford County: Magnolia's Garvin 1, swc se 10-23s-13w, abnd 3870.

Wichita County: Jones Oil Co. et al's Freeland 1, ne ne sw 25-18s-37w, abnd 4998.

Woodson County: King Oil Co. et al's Hare 1, sw nw ne 32-25s-14e, abnd 1460.

King Oil Co. et al's Hare 2, sw nw ne 32-25s-14e, abnd 685.

KENTUCKY WILDCATS

Daviess County: H. C. Amis' Robinson 1, 8-P-30, abnd 1582.

Henderson County: Carter Oil Co.'s Utley 1, 15-O-23, abnd 2783.

Carter Oil Co.'s Brantley 1, 6-O-22, abnd 2767.

Warren County: F. Puckett et al's Granger 1 16-E-36, abnd 900.

SOUTH LOUISIANA WILDCATS

Iberia Parish: Gulf's Marie Jeanminette 1, 1090 sw alg sel lse fr its e cor 150 nw at ra to sd line, 8-13s-6e, Grand Marias area, abnd 5-8-47 at 9011.

Jefferson Parish: Calif. Co.'s E. J. Bernstein 1, 2-16s-23e, 5000 ne Delta Farms prod, abnd 5-12-47 at 11,291.

St. Landry Parish: Superior's J. J. Creduer et al 1, 1090 s 2530 e of nwc 30-8s-4e, 1¾ mi s Cankton prod, 2 mi ne Bosco prod, abnd 5-8-47 at 11,293.

MICHIGAN WILDCATS

Lapeer County: C. G. Wilcox's Bailey 1, sw sw sw 33-9n-12e, abnd 5-1-47 at 2580.

Mecosta County: Lincoln and Atha's Rosenwagg 1, nw ne nw 15-13n-9w, abnd 5-11-47 at 1497.

Newaygo County: Sun's Frens 1, ne ne sw 30-12n-13w, Traverse 2229, abnd 5-9-47 at 2252.

Tuscola County: E. E. Brehm's Begle 1, ne ne ne 21-15n-8e, abnd 5-10-47 at 3685.

MISSISSIPPI WILDCATS

Jefferson County: Ohio's Hard Times Plantation 1, nec 35-8n-1w, Wilcox 3806, Selma 8313, Tuscaloosa 9280, Massive sd 10,085, abnd 5-13-47 at 10,210.

Scott County: Roy L. Fisher's Harmon 1, se sw 24-6n-6e, Wilcox 1550, Eutaw 5658, Tuscaloosa 6120, abnd 5-11-47 at 6192.

NEW MEXICO WILDCAT

Grant County: Colusa Remedy Co.'s State 1, nw se se 3-20s-11w, abnd 5-7-47 at 1890.

OHIO WILDCAT

Hocking County: Frank O'Mara's T. H. Wilson 1, ne se 3 Starr, Clinton 3485, abnd 5-11-47 at 3525.

WEST TEXAS WILDCATS

Midland County: Magnolia's Glass 1, c ne se T&P Ry. 30, blk 40, T-4-S, abnd 5-15-47 at 5513.

Pecos County: G. F. Aldrich et al's Mueller-Shell 1, 330 fr se&swl H&GN 118, blk 10, elev 2362, San Andres 2025, abnd 5-11-47 at 2118.

WEST CENTRAL TEXAS WILDCAT

Schleicher County: Francis A. Callery et al's Jones 1, c sw sw GH&SA 31, blk K, elev 2278, Ellenburger 5350, abnd 5-13-47 at 6001.

NORTH TEXAS WILDCAT

Archer County: J. C. Man, Jr. et al's Harris 1, 1250 snl 750 ewl blk 76, Harris sbdn, abnd 4-15-47 at 1371.

NORTH CENTRAL TEXAS WILDCAT

Callahan County: Capital Investment Co.'s Windham 1, 330 snl 1003 ewl sw¼ G. W. Deaton sur 371, elev 1950, Palo Pinto 2681, Gardner sand 3261, Bend 3680, Mississippi 4255-77, Ellenburger 4365, abnd 5-10-47 at 4503.

EAST CENTRAL TEXAS WILDCAT

Grayson County: Denver Prod. & Ref. Co.'s Rich 1, 330 n 330 e of nwc Wm. McGill sur, but in I&GN Ry. sur, elev 790, abnd 5-10-47 at 13,352 in Simpson shale.

UPPER TEXAS COAST WILDCATS

Brazoria County: McCarthy O&G Corp.'s S. A. Meyer Est. 1, 660 fr wl and ely/nl 90.6-ac lse, C. Smith Lge, 1½ mi s Blue Lke prod, abnd 5-9-47 at 11,072.

Ft. Bend County: H. W. Snowden's Mary Hobbs 1, 330 fr n&el 220-ac lse, A. Vallett sur (ely ½ H&TC sur 6), abnd 5-10-47 at 9015.

Montgomery County: Moran Oil Co.'s Hutchins-Sealy Nat. Bnk., Tr. 1, 330 fr sw 660 fr nwl 640-ac lse, Jonathan C. Pitts sur, abnd 5-11-47 at 5050.

Wharton County: Progress Pet.-Producers Corp. of Nev.'s G. R. Hawes et al 1, 467 fr nw&nel 100-ac lse, D.D.D. Baker sur, abnd 5-11-47 at 6028.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Duval County: Bridwell Oil Co.'s Clara Driscoll Est. 1, 3270 fr el 3180 fr sl W. B. Blanchard sur 46, 1700-ac lse, abnd 5-7-47 at 4408.

Massingill & Rife's Juan Benavides 1, 160-ac lse, sh 3, El Mesquite Gr, 4½ mi n Hebronville, abnd 4-30-47 at 4204.

Webb County: Blanco, Buchanan, Lefevre's P. Leal 1, 330 fr s&el 349-ac lse, in sur 459, 460, 660 n of P. Leal 1 gas disc, abnd 5-8-47 at 1308.

O. W. Killam's Laurel Fee 1, 990 fr el 1650 fr nl sur 1104 and 1280-ac lse, abnd 5-4-47 at 3576.

SOUTH CENTRAL TEXAS WILDCATS

Frio County: Geo. Parker-Chas. L. McCune's J. D. Oppenheimer 1, 1000 fr s&el I&GN sur 11, 320-ac lse, abnd 5-7-47 at 4756.

Guadalupe County: Lupe Oil Co.'s Mrs. Nellie Walker Nolte et al 1, 10,400 fr nl 342 fr wl John Sowell Lge 16, Edward li 1842, abnd 5-4-47 at 2000.

Williamson County: Fred Hughes' C. Bockmier 1, 6300 fr nel 1050 fr sel P. Cartwright sur, 173-ac tr, Edwards li 1890, abnd 3-26-47 at 1906.

J. R. Thompson's John Kubicek 1, 330 fr el 450 fr nl 200-ac lse, P. J. McMahon sur 115, Austin chalk 780-812, abnd 3-20-47 at 812.

UTAH WILDCAT

Emery County: R. D. Robinson's State 1, ne ne ne 32-26n-13e, Nequoi Arch, abnd 2642.

WYOMING NEW PAY TEST

Fremont County—Alkali Butte: Texas' Unit 4, sw ne nw 1-33n-95w, Nugget 4908, Chugwater 5195, Dinwoody 6453, Phosphoria 6522, Tensleep 7355, abnd 5-15-47 at 7430.

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AT YOUR SERVICE AT ALL TIMES

N. N. Jones, acting superintendent in Humble Oil & Refining Company's production department for the Gladewater district, Gladewater, Texas, has been appointed district superintendent, replacing **W. C. Anderson,** who died April 19. **G. R. VanLandingham,** Hobbs, N. M., district chief clerk, has been transferred to the West Texas division office at Midland, Texas, and promoted to assistant division chief clerk. **M. L. Weatherall,** Wasson district chief clerk, Denver City, Texas, has been transferred to the Hobbs, N. M., district, replacing **VanLandingham. A. D. Eady,** assistant Wink district chief clerk, Wink, Texas, has been transferred to the Wasson district and promoted to district chief clerk.

J. A. Warren has been transferred from the land department in Sohio Petroleum Company's Shreveport office to the Jackson, Miss., office as district landman. **Ed Tolar** and **J. E. Shaddock,** formerly in the Jackson office land department, have been transferred to the land department of the Shreveport office.

E. M. Butterworth, president of American Overseas Petroleum Company, has returned to San Francisco from the Netherlands East Indies.

Jerry Harriss of Standard Oil Company of California's exploration department, will leave for Arabia about June 1.

Frank A. Morgan, vice president of Richfield Oil Corporation, has returned to Los Angeles from Australia. Six hours out of Oahu, an engine went dead on the plane on which he was returning. The airliner was able to make the Santa Barbara (Calif.) airport escorted by two Coast Guard rescue planes.

Cecil H. McSpadden and **Edwin D. Coulson** of Houston and **Cecil L. Watts** of Liberty, Texas, have incorporated the Cecil Oil Corporation with capital stock of $10,000. Headquarters are at Houston.

Shirley M. Miller of Odessa and **F. A. Nelson** and **J. W. Thomas, Jr.,** of Midland, Texas, have incorporated the Shirley Miller Drilling Company, Inc., with headquarters at Midland.

John R. Murphey has been employed by the Houston Oil Company of Texas as landman in the Shreveport office. Murphey formerly was in charge of the office of **A. G. Oliphant** in Shreveport and more recently was an independent operator.

James Lee Wilson of Houston has been awarded the Shell Fellowship by Shell Union Oil Corporation. He is a candidate for a doctor of philosophy degree in geology at Yale University.

S. F. Shaw, gas-lift specialist of San Antonio, will be in Michigan during the early part of June to study some of the oil fields, and during July and August will be in the Turner Valley field, Canada, making a study of gas-lift operations.

Joe T. Dickerson, general attorney on Shell Oil Company's regional staff, has been named Houston area manager, replacing **W. A. Alexander,** who was named area manager at Tulsa. Dickerson has had 15 years of managerial experience on the legal side of the company's operations. He served three years with the Army Air Corps, from which he was discharged in 1945 with the rank of lieutenant colonel.

Joe T. Dickerson

W. N. Grinstead, treasurer, was elected vice president of Ohio Fuel Gas Company at Columbus, Ohio, to succeed **P. S. Clapp,** transferred to New York with Columbus Engineering Corporation. Grinstead, also reelected treasurer, now supervises distribution and sales with **F. T. Rainey** as general sales manager.

William K. Warren, president, Warren Petroleum Corporation, Tulsa, has been granted the Hanlon award for outstanding service to the natural gasoline industry. The award is presented each year by the Natural Gasoline Association of America. Warren was the 11th recipient. He entered the oil industry in 1916 and in 1922 opened his office in Tulsa, selling natural gasoline products. Warren Petroleum Corporation, which is observing its 25th anniversary this year, grew out of the small company.

B. F. Phillips, Jr., A. O. Phillips and **Sam A. Trant,** all of Dallas, have organized the Trant-Phillips Drilling Company to operate in Texas, with headquarters at Gladewater.

J. G. Tolpin, formerly with Universal Oil Products Company, has been appointed to the new position of editor of foreign technical information in the Development and Patent Department, Standard Oil Company of Indiana. From 1937 until recently, Tolpin was editor of the Survey of Foreign Petroleum Literature, a weekly service which reviewed for 15 oil and chemical companies in the U. S. the progress of Russian research in oil refining and chemistry. He is a native of Russia and now a citizen of the U. S. He was graduated in chemistry from the University of Kiev and received his master's degree in chemical engineering from Columbia University, New York.

J. G. Tolpin

William H. Strickler, superintendent of land and exploration for Sohio Petroleum Company in Michigan, has been named manager of all Sohio's production activities in the state. **J. E. Buckley,** assistant superintendent of operations, has been appointed superintendent of operations, succeeding **C. C. Irby,** who has recently moved to Kansas for Sohio. Strickler entered the oil business with Goll, Graves and Mechling, was later associated with the Basin Oil Company, then was an independent oil operator and lease broker in Michigan until he joined Sohio in November, 1939, in the land department at Allegan, Mich. He was later put in charge of Sohio's land work in southwestern Michigan and in 1942 took charge of all of Sohio's land and exploration work in that state.

John Thomas of Standard Oil Company of California's drilling department at Rio Vista, Calif., has been transferred to the state of Washington, where he is supervising drilling of the company's Alderwood Community 1 wildcat near Everett.

John Stephens, San Joaquin division engineer for Chanslor-Canfield Midway Oil Company, has been promoted to assistant chief engineer with headquarters in Los Angeles.

Paul Montgomery, recently executive assistant to the commissioner of the Louisiana Department of Conservation, has joined Bates and Cornell, consulting petroleum geologists and engineers of Lafayette, La. He formerly was field engineer, acting state geologist and executive director of the Office for Natural Gas Conservation.

J. C. Hall has been appointed manager of the British Columbia division of British American Oil Company, Ltd., and **A. E. Osborough** has been appointed sales manager. Hall succeeds **A. P. Bennett,** on sick leave. Both the new officials were formerly at the Calgary headquarters.

J. R. Warford, formerly managing director of two foreign marketing subsidiaries of Sun Oil Company, has been appointed special representative in the United States to head a newly created wax section in the company's industrial products department. Until recently Warford has been managing director of British Sun Oil Company, Ltd.; Netherlands Sun Oil Company and its subsidiary, Belgium Sun Oil Company. **George W. Mock,** technical representative for wax products, will be associated with him in his new post.

Kurt H. deCousser of Lansing, Mich., Socony-Vacuum Oil Company, one of the original six members of the State Oil Advisory Board when it was created in 1939, has been reappointed for a three-year term. deCousser has not been a member of the board for the past six years. The commission also reappointed **Edward J. Bouwsma** of Muskogen, Old Dutch Refining Company, for a new three-year term on the board. DeCousser succeeds **Cecil C. Irby,** Sohio Petroleum Company, recently transferred out of the state.

MEN IN THE INDUSTRY NEWS

Roy E. Anderson, who recently resigned as director of the Tanker Division of the U. S. Maritime Commission, has become a partner of Tankers Company and vice president of Tankers Company. Inc. Anderson started with Vacuum Oil Company in 1926 and remained through the merger in 1931 with Standard Oil Company. In 1942, Admiral Emory Land, chairman of the U. S. Maritime Commission, requested the services of Anderson to assist in war tanker operations. He also was a member of the Allied Tanker Coordinating Committee and chairman of the U.M.A. Tanker Allocations Committee.

»

Henry M. Schmitt, chemical industry manager for Brown Instrument Company, discussed automatic chemical process control at a joint meeting of the Royal Swedish Academy of Engineering and Science and the Association of Technical Physicists at Stockholm, Sweden.

»

Walter H. Gebhart, first vice president of Henry Disston & Sons, Inc., manufacturers of steel and cutting tools, Philadelphia, was elected president of the American Supply & Machinery Manufacturers Association at Atlantic City, succeeding **Theodore F. Smith,** president of Oliver Iron & Steel Company, Pittsburgh.

Glynn Williams has been named chief engineer for Axelson Manufacturing Company, succeeding **E. W. Ostrom,** resigned. Williams has been with Axelson since 1934, serving in various capacities in the engineering department, and recently was divisional head of aircraft engineering. Ostrom was with the company 26 years, beginning in 1920, and became chief engineer in 1934. He is known in the petroleum engineering field for his work in standardization of subsurface pumping equipment.

Glynn Williams

»

Joseph T. Cashman, until recently an attorney for Shell Oil Company, has been appointed administrative assistant to **D. B. Hodges,** New York vice president, transportation and supplies. Cashman began his career with Shell as a clerk. Shortly thereafter he was promoted to attorney in the legal department, which position he maintained until his present appointment.

»

W. T. McCurdy has been named district manager for Mack Trucks, Inc., to serve in Tennessee and Arkansas.

W. C. Philley, manager of Oil Well Supply Company's Wichita Falls store since January, 1946, has been appointed division credit manager for the U. S. Steel subsidiary's Gulf Coast Division with headquarters in Houston. He succeeds **J. W. Turner,** resigned.

Deaths

T. R. Russell, 43, of Mt. Pleasant, Mich., independent oil operator, died May 10. Born in Bradford, Penn., Russell went to Michigan in 1935 with Oil Well Supply Company and had served Leonard Pipe Line Company, Erie Pipe Line Company and Franklin Tool Company before entering independent development work three years ago.

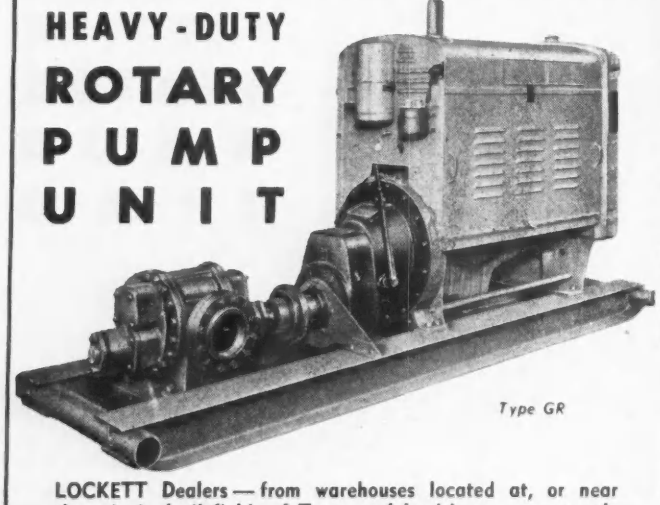
»

Woodburn C. Winings, 54, manager of Goodyear Tire & Rubber Company's mechanical goods division, Akron, Ohio, and associated with the firm 32 years, died May 10 in Brunswick, Ga. A native of Indianapolis, Winings joined Goodyear in 1915 as a salesman. After holding sales posts in Indianapolis and Chicago, he was transferred to Akron in 1928 as assistant manger of the company's mechanical goods division, and became manager in 1930.

»

Dan Dillon, 59, San Antonio independent operator, died May 16 in San Marcos, Texas.

LOCKETT-WORTHINGTON
HEAVY-DUTY
ROTARY
PUMP
UNIT



Type GR

LOCKETT Dealers — from warehouses located at, or near the principal oil fields of Texas and Louisiana — can supply Worthington Pumps to meet every pumping need.

Worthington Pumps are adaptable for use with any power unit — gas, gasoline, Diesel, or electric motor of any type or manufacture.

Lockett Dealers can also promptly supply, from warehouse stock, *genuine* Worthington Repair Parts. We also carry a large replenishing stock of Worthington Pumps and *genuine* Worthington Repair Parts at our Houston and New Orleans Warehouses. For dependable, efficient service, let a Lockett Dealer supply your pump-equipment needs.

A. M. LOCKETT & COMPANY, LTD.

NEW ORLEANS HOUSTON DALLAS

STOP CORROSION

at LOW cost and big savings on your*

• Pulling Costs
• New Steel
• Shutdown Time

with THOMPSON-HAYWARD

FORMALDEHYDE

for corrosion control

*Dependable protection for sucker rods and parts from hydrogen sulphide corrosion and corrosive mine and well waters.

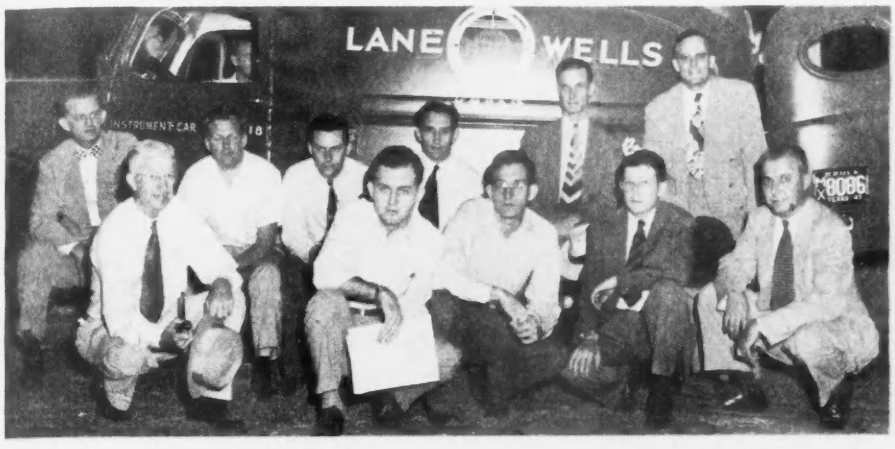
Ask our nearest representative for detailed facts

THOMPSON-HAYWARD CHEMICAL CO.

Dallas Houston Denver
Wichita Tulsa San Antonio
New Orleans

(A)

Radioactivity Logging Demonstrated



Radioactivity instrument car at The University of Texas demonstration. Left to right are C. F. Ludwig, Houston; Paul Roston, Howard Bradley, Roy Dwyer; John L. P. Campbell, Houston; Warren J. Jackson, Dallas; Prof. H. H. Power, Herbert Poyner, J. C. S. Reynolds, Prof. C. F. Weinaug, and R. M. Rutledge, Jr., Houston.

Interest in logging methods was stimulated in the University of Texas Petroleum Engineering Department by a lecture-demonstration educational program on gamma ray and neutron techniques.

The lecture, supplemented by sound-color movies, was delivered by John L. P. Campbell, geologist, in charge of the technical service of the Lane-Wells organization. The principles of gamma ray and neutron logging were explained in detail and the special applications of these methods emphasized. Methods of making surveys in wells were shown by cross-sectional diagrams in animated moving pictures.

The second series of the program was held on the equipment log of the Petroleum Engineering Department, where a 300 foot well and derrick provided the necessary oil field background for actual full-scale demonstrations. A radioactivity well logging unit, consisting of hoist and gun-perforating truck and instrument truck, were open for inspection and study during well logging operations.

Other officials of the Lane-Wells Company participating in the logging demonstration were: Warren J. Jackson, Dallas; C. F. Ludwig and R. M. Rutledge, Jr., Houston.

Republic Supply Gets Plaque From B. F. Goodrich Company

In recognition of 20 years of association with The B. F. Goodrich Company, Republic Supply Company has been awarded a service award plaque, according to John L. Collyer, president of The B. F. Goodrich Company, Akron, Ohio.

The award was presented to A. B. Judd of Republic by D. R. Anderson, Goodrich district manager.

Republic handles a complete line of industrial rubber products for the oil industry and first became associated with Goodrich Company in 1927.

The distinctive plaque bears the figure of a stalwart youth in bas-relief posed on one knee and holding the world in one hand and a victory wreath in the other.

Oil Well Opens Store, Makes Several Personnel Changes

Opening of a new store at Pauls Valley, Okla., and several personnel changes have been announced by Mark Barkhurst, manager of the Mid-Continent Division of Oil Well Supply Company, U. S. Steel subsidiary.

Roy F. Shaner, manager of the Wewoka, Okla., store since November, 1945, has been transferred to Oklahoma City as assistant District engineer. He is succeeded at Wewoka by Carey E. Lance.

Joe F. Daves, store manager at Madill, Okla., has been named manager of the new Pauls Valley store. Leon G. Hutchinson, store man at Oklahoma City, succeeds Daves.

Grover S. King, store manager at Abilene, Texas, has been appointed manager of the Greggton store, succeeding O. O. Beasley, resigned. King is succeeded at Abilene by Stewart M. Miller of the Greggton store.

Branch Managers Appointed By Black, Sivalls & Bryson

Black, Sivalls & Bryson, Inc., has consolidated its Mississippi oil field equipment operations in the new branch at Brookhaven. Ted Falls, manager of the recently closed Natchez branch, and Tom R. Sessums, will operate the Brookhaven branch.

Shifts have been made of branch managers. Ed Poole, who has been manager at Salem, Ill., has been sent to the Odessa, Texas, branch. Harrell Bruner, formerly of Carmi, Ill., has moved to Salem, where he will assume the managership. Andy Shaw has been sent from Oklahoma City to direct the Carmi branch.

FOR SALE
Seamless Steel Pipe
(Specification ASTM A-106—Grade B)

Total Feet Available	O. D.	Average Wall	Price Per 100 Feet
915	5 9/16"	.950"	$300.00
2585	5 9/16"	.789"	258.00
2475	6 5/8"	.996"	384.00
1470	8 5/8"	1.237"	658.00
780	10 3/4"	1.443"	966.00

Average Lengths Available

Item #1—18 to 24 ft. Item #3—18 to 22 ft.
Item #2—17 to 24 ft. Item #4—13 to 24 ft.
Item #5—20 to 24 ft.

TERMS

½% 10 Days—Net 30
F.O.B. Cudahy, Wis.

$25.00 charge on lots of less than 250 feet on an individual item.

All offerings subject to prior sale.

LADISH CO.
CUDAHY · WIS.
(MILWAUKEE SUBURB)

IF You Worry About Feedwater Treatment Investigate SAND-BANUM

Here is a pure colloidal compound that does remove and prevent boiler scale and corrosion.

20 Years And More

Sand-Banum has been safely and automatically doing this for hundreds of plants.

Guaranteed Harmless

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NEW YORK CITY 20

MANUFACTURERS' NOTES

Continental Makes Changes In Supervisory Personnel

The Continental Supply Company has announced two changes in supervisory personnel.

Charles Spitzfaden, Jr., has been made an assistant district manager in charge of Kansas operations, with headquarters in Wichita. He joined Continental in 1937 as a machinery salesman in Oklahoma. His most recent position has been as assistant manager of machinery sales in the Tulsa area.

William R. Gottshall, until recently assistant manager of tubular sales for the Oklahoma-Kansas district, has been appointed assistant district manager with headquarters in Oklahoma City. He will be in charge of the company's Oklahoma sub-district. Gottshall has been with Continental since 1936.

Tulsa Firm Changes Name

Tulsa Boiler and Machinery Company has announced the selection of a new business name, Flint Steel Corporation. The change will not affect the ownership, management, personnel or policies of the company, according to Chas. W. Flint, president.

Minneapolis-Honeywell Company Expands Facilities in Houston

Growth of industry throughout the Southwest has resulted in a further expansion of the Houston office of Minneapolis-Honeywell Regulator Company, R. L. Mallory, regional manager, announced.

The company has moved to a new location at 2123 Travis Street in order to house the enlarged sales and service staff of 20 persons, Mallory said.

Changes in Executive Personnel Made by Caterpillar Company

Announcement of personnel changes involving several Caterpillar Tractor Company executives has been made by L. B. Neumiller, president.

E. W. Jackson, general parts manager for Caterpillar since 1944, has been appointed director of parts and service; M. T. Deames has been promoted from assistant general parts manager to the general parts managership; and W. Blackie, vice president and chief administrative head of the accounting and merchandise departments, has also assumed administrative guidance of the traffic department.

J. H. Deaderick, vice president in charge of parts, service and traffic departments since 1943, and E. L. Murray, credit manager of the treasury department, have resigned to join Fred Elder of Phoenix as Caterpillar distributor for the greater part of Arizona.

Thermoid Company Acquires New Warehouse in Wabash, Ind.

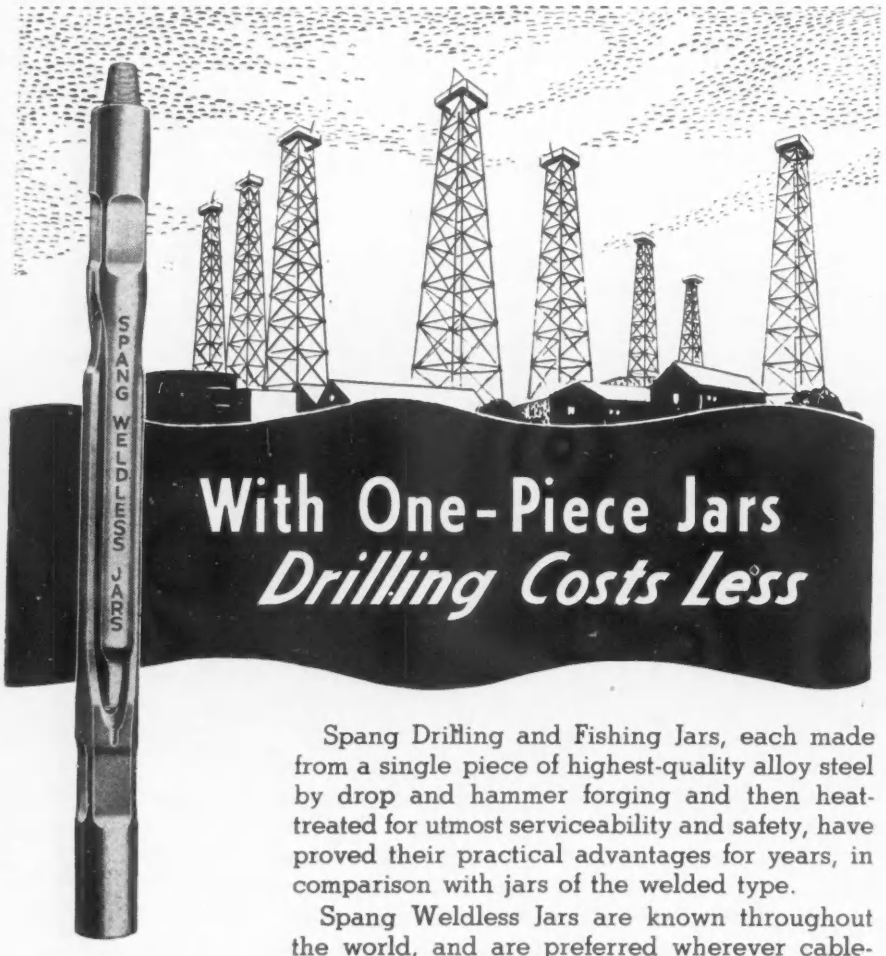
Thermoid Company has acquired a new warehouse in Wabash, Ind., which opened April 15. With the opening of this unit, all business formerly handled by the key warehouse in Chicago will be transferred and that operation will be closed. Thermoid's customers in the central and Midwest trading areas, formerly served from Chicago, will be served more readily from the new warehouse operating in a non-congested area.

The Wabash warehouse will be operated by a staff of 18, under the direction of H. L. Conover, who will go to Wabash from the main office in Trenton. Shipping from the new warehouse will be largely by truck, and will permit door-to-door shipments to the larger cities.

Harvester Establishes Separate Motor Truck Branch at Omaha

International Harvester Company has established a separate motor truck branch at Omaha, Neb.

J. D. Richardson, former assistant manager of the company's local combination branch, will head the new branch. As manager of the Omaha motor truck branch, he will have complete charge of the local retail sales organization, and also will direct sales and service to International Harvester's motor truck dealers in the surrounding territory.



Spang Weldless Drilling Jar

With One-Piece Jars
Drilling Costs Less

Spang Drilling and Fishing Jars, each made from a single piece of highest-quality alloy steel by drop and hammer forging and then heat-treated for utmost serviceability and safety, have proved their practical advantages for years, in comparison with jars of the welded type.

Spang Weldless Jars are known throughout the world, and are preferred wherever cable-tool drilling is done. While they cost more to buy, they are more economical to use because of lower footage cost and less time lost in fishing and replacement. Standard stroke lengths, diameters, and joint sizes are readily available at field stores. Special requirements can also be met, though less promptly and at some additional cost.

For the best in Cable Tools
SPECIFY SPANG

THE HIGHER STANDARD

SPANG & CO.
BUTLER, PA.

YOUR DEALER SELLS SPANG TOOLS

SQUEAKS from the BULL WHEEL

Nice Try

Noticing a pretty new face in his congregation, the minister was bound to display a cordial interest, and after the services, as he was shaking hands at the door, he told her politely: "We are pleased to have you with us. If you will give me your name and address, I shall be happy to call."

"Cut it out, Doc. I already got a boy friend."

Out for the Exercise

"Have a good time last night, Gladys?"

"Naw, I got too much will power."

Hold the Phone

There was a new phone operator and the supervisor was listening in just to be sure. The test over, the supe issued her report: "Darling, you did okay. I would like to make one little suggestion. I think it would be better to use the routine 'One moment please!', instead of 'Hang on to your drawers, Mister'!"

Between Friends

First Lawyer: As soon as I realized it was crooked business I got out of it.

Second Lawyer: How much?

Roots of Life

"What two kinds of wood are used in making matches?"

"He would and she would."

OWEN

Type "A" Work Benches

Finest in the Field!

Owen Type "A" Work Benches are all-steel, all-welded and mounted on rigid steel skids. Drawers are roller-mounted, with forward stops and a central locking mechanism. Guards prevent water and oil from draining in on tools. Sturdy stand provides convenient space for mounting vise. Six drawers for hand tools and instruments, a big bin for rags and steel pegs on the back apron for wrenches provide plenty of storage space.

They're the finest in the field for saving tools and providing a safe, convenient working space. Put one on each rig you operate . . . they'll "dress up" its efficiency and appearance.

SOLD THROUGH ALL SUPPLY STORES

OWEN TOOL COMPANY

ROUTE 9 BOX 800-B V-2-4341 HOUSTON, TEXAS

Dumb Animals

"It says here that laughing hyenas eat once a week and mate once a year."

"Then what have they got to laugh about?"

Hints for Householders

"I only go out with women who wear glasses."

"Why?"

"I breathe on them, and the gal can't see what I'm doing."

Women are Observant

"Wasn't it disgusting the way those men stared at that girl getting on the train?"

"What train, dear?"

The Woman's Way

"Grace tells me she's taking hot baths to get her weight down."

"Yes, she calls it the scorched girth policy."

Sad Old Tune

"Do you play any musical instrument?"

"Not away from home."

"How peculiar. And what do you play at home?"

"Second fiddle."

Better Ask His Wife

"I'll never marry a man who snores."

"I don't blame you, Daughter. But be careful how you find out."

(Chic) Sales Talk

"I smoke that brand in the can," said the important customer to the girl in the tobacco store.

"A good place," she sniffed.

This Curious World

While strolling on the beach, he saw a beautiful nude girl emerge from the water. "Boy, oh, boy! Would she look good in a bathing suit!"

Many a woman thinks she bought a gown for a ridiculous price when in reality she bought it for an absurd figure.

And then there was the shoemaker's daughter who gave the boys her awl.

Sailor's lament: "I've given the best years of my wife to the Navy."

It's usually necessary to wait until the folks turn in before you can tell how a girl will turn out.

Kissing a woman just because she wants you to is like scratching a place that doesn't itch.

Quite a Drop

A soldier in a carrier pigeon outfit was singing at his work. A passing captain commented. "You don't mean to tell me you enjoy that work?"

"Yessir. I used to be in the cavalry."

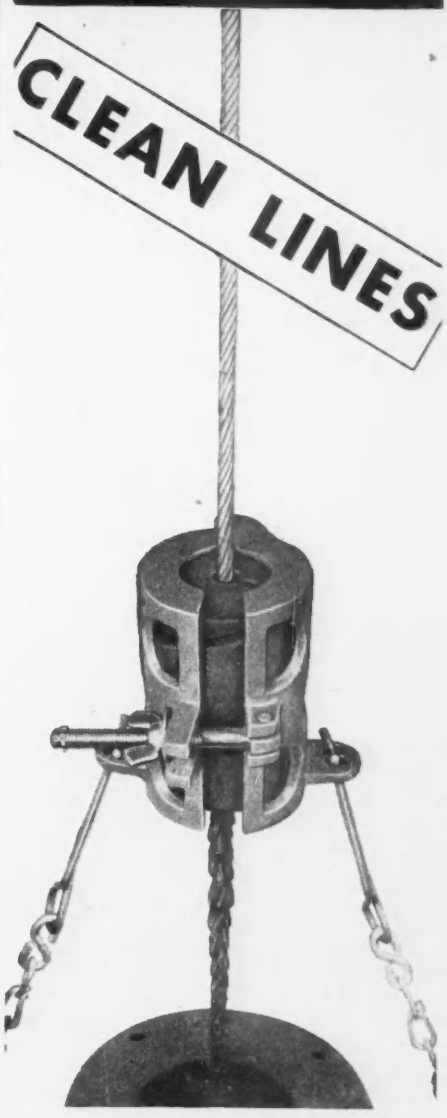
Life Is Like This

"So you're 100 years old? How have you managed to live so long?"

"Well, I got married when I was 21 and the first thing the missus and I did was to have a long talk. We decided that if we had an argument the loser would take a long walk so he wouldn't stay mad. I guess, son, that the 79 years of fresh air has done me more good than anything else."

"Best Bet Yet"

CLEAN LINES



A clean wire line helps your crew. They can work safer and better on a clean floor, free from drippings. With a Patterson-Ballagh Wire Line Wiper the line is stripped completely of mud and oil. A compact steel housing contains a spiral rubber which is inexpensive and easily replaced. The rubber wipes the line as it comes out of the hole. Spark-proof. Use one on every well.

Refills made of PBX Special Rubber—Oil and weather resistant.

See Composite Catalog

Specify

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A DIVISION OF BYRON JACKSON CO.

"Best Bet Yet"

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931 Russ Bldg., San Francisco 4

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Drop-Forged • Heat Treated • 2 Sizes
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Durbin-Boomer F-2—2 swivels, 7/16, 1/2 or 5/8" chain

Malleable Iron • Heat Treated • 5 Sizes
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DELTA No. 1—1 swivel, 5/16 or 3/8" chain
DIXIE No. 1—2 swivels, 7/16 or 1/2" chain
LONE STAR 1—2 swivels, 7/16, 1/2 or 5/8" chain
LONE STAR 2—2 swivels, 7/16, 1/2 or 5/8" chain

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STANDCO BRAKE LINING
Stands the gaff and gets the job done without scoring brake rims. See pages 3608-3613, Composite Catalog.
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The Robertson Company
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HOUSTON 4, TEXAS

Have You Checked
The Trading Post?
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Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138. 823½ Monroe Street, Fort Worth, Texas